STUDIA GRAECA ET LATINA
GOTHOBURGENSIA
XLIII

SVEN-TAGE TEODORSSON

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ACTA UNIVERSITATIS GOTHOBURGENSIS

Printed with the aid of the
Humanistisk-Samhällsvetenskapliga Forskningsrådet

© Sven-Tage Teodorsson
Distributors:
ACTA UNIVERSITATIS GOTHOBURGENSIS
Box 5096, S-402 22 Göteborg 5, Sweden

ISBN 91-7346-111-3 (cloth)
ISBN 91-7346-113-X (pb)
ISSN 0081-6450

Printed in Sweden by ⌧ Berlings, Arlöv 1982, 9856

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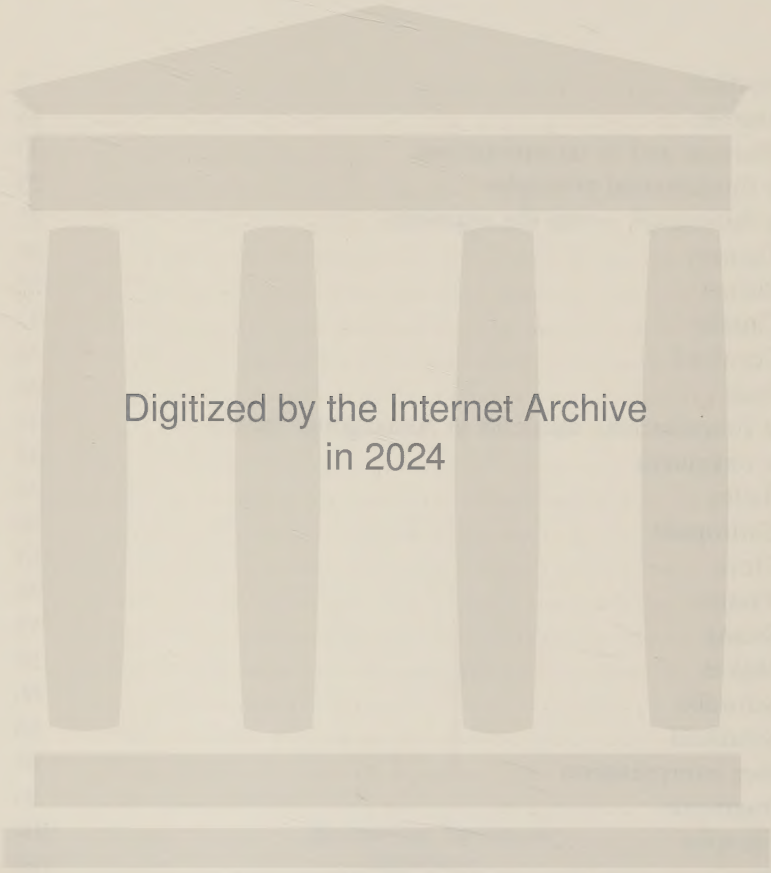

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INTRODUCTION

Anaxagoras is a fascinating, not to say mysterious, personage in Pre-Socratic philosophy. When studying the scanty remnants that have come down to us of his system of thought, one is puzzled by the contrast, as it seems, between – on the one side – the sublime notion of the *Nous* as the moving principle that once initiated the development of the *cosmos*,[1] and the problematic doctrine of the homoeomeries on the other. These two ideas have, from Aristotle down to our time, been regarded as the fundamentals of Anaxagoras' thought, thus creating the divided attitude towards this philosopher among his students: partly reverential admiration, partly intellectual embarrassment.

Our biographical knowledge about Anaxagoras is very limited. As certainty can be considered only that he (1) was born in Clazomenae in Ionia, (2) moved to Athens and lived there for a long period during which he attained a high reputation as a philosopher, (3) was prosecuted on a charge of impiety and exiled from Athens,[2] (4) settled at Lampsacus in Ionia, where he died at somewhat more than seventy years old.

The biographical tradition about Anaxagoras is confused but the limits of his lifetime are fairly well definable. It is widely accepted that

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[1] Plat. *Phaed.* 98 B 7 ff.; Arist. *Metaph.* 985 a 15.

[2] Gershenson-Greenberg (1964: 346–348) deny that Anaxagoras was ever tried, alleging that the historians of the third century B.C., Sotion, Satyrus and Hermippus, who are quoted as sources of the event by Diog. II 12–13 (DK 59 A 1), should have exploited the passage in Plat. *Apol.* 26 D 1 to reconstruct such a trial and so make Anaxagoras a martyr and forerunner of Socrates. Of course, the probability of the trial being a historical fact – despite these historians differing in detail – is much greater than its being a fiction based on these few words in Platos Apology.

Anaxagoras was born about 500[3] and died in 428/7.[4] The date of his arrival in Athens may be 480, if we are to trust Diogenes[5] when he tells us that he is said to have come there at the age of twenty κατὰ τὴν Ξέρξου διάβασιν.

The date of his trial and exile from Athens is, however, even more difficult to establish. There are the statements by Demetrius of Phaleron[6] that he was twenty years old when he came to Athens and that he stayed there for thirty years, which may be trustworthy. But Diogenes[7] notes that opinions about the trial differ: Sotion states that he was prosecuted by Cleon (ca. 433–430), while according to Satyrus he was tried by Thucydides, who is known to have been ostracised in 443. Satyrus emphasizes that Anaxagoras was not only accused of impiety but also of medism, which seems to speak in favour of the earlier date. Another argument for an early departure from Athens by Anaxagoras would be the fact that Socrates is never confronted with this famous philosopher in any Platonic dialogue, while Socrates is said to have listened to Archelaus,[8] the disciple of Anaxagoras. If the master himself had taught in Athens when Socrates was a young man it can be taken for granted that he heard his lessons. Although this argument is not decisive, it is noticeable that Plato[9] represents Socrates as having knowledge of the doctrine of Anaxagoras only through his writings. If he had actually heard him in person, it would have been natural for Plato to have Socrates tell his friends so.[10]

Davison (1953:42–43) suggests that Thucydides' attack on Anaxagoras, as stated by Satyrus, took place ca. 456/5. But this does not conform with the note of Demetrius of Phaleron[11] that he stayed in Athens for thirty years, unless he settled there before 480, presuppo-

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[3] Diog. II 7 (DK 59 A 1), whose source was Apollodorus. Cf. also Arist. *Metaph.* 184 a 11 (DK 59 A 43) who states that Anaxagoras was prior to Empedocles in age but posterior to him in work. Unfortunately, we have no reliable information as to when Empedocles was born.

[4] Scaliger's emendation of the date given by Apollodorus (l.c.), the first year of the seventy-eighth olympiad (468/7), to the first of the eighty-eighth olympiad yields 428/7.

[5] Diog. II 7 (DK 59 A 1).

[6] Diog. II 7.

[7] Diog. II 12 (DK 59 A 1).

[8] Diog. II 16 (DK 60 A 1).

[9] *Phaed.* 97C–98B. Cf. also *Apol.* 26 D 1.

[10] This was considered by Burnet 1945[4]: 256, n. 3.

[11] See above, footnote 4.

sing that this is the year of arrival actually stated by Demetrius.[12] A date of arrival before 480 would also counteract the statements of Demetrius that Anaxagoras was twenty years of age when he began his activities as a philosopher in Athens, and the evidence offered by Apollodorus that he was born in the seventieth olympiad (=500–496). But, if these dates are sound, how could Demetrius assert that Anaxagoras stayed in Athens for thirty years?

Davison (l.c.) is hardly right in surmising that Anaxagoras spent two separate periods in Athens: After having been exiled in 456/5, prosecuted for impiety and medism, he is supposed to have lived in exile until, after the Thirty Years' Peace, he got an amnesty and returned to Athens some years later[13] for another sojourn until he was exiled a second time by Cleon (ca. 433–430).

Not only is this assumption entirely conjectural, but it also again brings up the old question why Socrates is not represented by Plato as meeting this famous philosopher, if he lived in Athens in the 430ies when Socrates was at the *acme* of his life. If, on the other hand, Anaxagoras left Athens for ever in the late 450ies,[14] when Socrates was still a teenager, the absence of Anaxagoras from the dialogues of Plato becomes natural.

It has also been considered that the high appreciation that Anaxagoras attained at Lampsacus[15] is more natural if he spent more than a couple of years there.

That Anaxagoras wrote on physics we know for certain. The earliest source for our knowledge about this is Plat. *Apol.* 26 D 1 (DK 59 A 35). However, there are two difficult problems about Anaxagoras' work: (1) Did the work comprise many books and, (2) when did Anaxagoras publish it? The answer to the first question is not very important, while the second is.

As to the extent of Anaxagoras' writings, we find that Plat. *Apol.* 26 D (DK 59 A 35) uses the plural, βιβλία, but Diog. I 6 (DK 59 A 37) οἱ

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[12] Cf. l.c. There can be little doubt that ἐπὶ Καλλίου (=456) is to be emended to ἐπὶ Καλλιάδου (=480). The suggestion of DK that the later date may be the more fitting is unjustified.

[13] Davison (1953: 43) suggests that he may have returned to Athens in 444.

[14] The vague statement in Diog. II 7 ἤρξατο δὲ φιλοσοφεῖν Ἀθήνησι ... ἔνθα καί φασιν αὐτὸν ἐτῶν διατρῖψαι τριάκοντα suggests a date of exile about 450, but it may well have taken place one or two years earlier.

[15] According to Diog. II 14–15 (DK 59 1).

δὲ ἀνὰ ἓν σύγγραμμα Μέλισσος, Παρμενίδης, Ἀναξαγόρας is an important indication that Anaxagoras did not publish many different works, seeing that Diogenes' information about Melissus and Parmenides as writers of only one book is most probably correct. Other writings that are attributed to him, on the squaring of the circle. (Plut. *De exil.* 17,607 F), on perspective (Vitruv. VII pr. 11), and a work of problems (Cod. Monac. 490, XV f. 483 v.) (DK 59 A 38–40), are almost certainly not by Anaxagoras. We are then entitled to conclude that Anaxagoras did actually write only one work.

The plural form βιβλία in Plat. *Apol.* 26 D caused Burnet (1945[4]: 257, n. 6) to surmise that Anaxagoras' work filled more than one roll and thus may have been "of some length". This is contested by Raven,[16] who argues that the parts of the work were probably short, seeing that the short quotations of the first part made by Simplicius "give us, with considerable repetitions, the whole basis of his system".

This is parobably true; the style of Anaxagoras is concentrated and compact, without long reasonings. That the work had been divided into many parts at Simplicius' time is clear from *In Phys.* 163, 18 (DK 59 B 17): Simplicius quotes only the first part and apparently did not have more than this one. In this first part Anaxagoras obviously presented the fundamental general principles of his philosophical system. There are many indications that Anaxagoras also dealt with special problems of astronomy, meteorology, generation of living beings, sense perception etc. We can take it for granted that Anaxagoras discussed such detailed topics after the general ontological first part of his work. This second part, however, need not have been very extensive; it may well have been as equally short and concentrated as the first part. The whole work of Anaxagoras may, then, perhaps have been available for only one drachma in 399 B.C., as is suggested by Plat. *Apol.* 26 D.

Now, the possibility of books being so cheap has rightly been doubted. But it should be observed that Plato does not really say that *the books* (τὰ βιβλία) can be bought for a drachma; what he actually says is that *such things,* such opinions (ταῦτα) can be bought so easily and, incidentially, not always but sometimes (ἐνίοτε). The conclusion would be that the young men of Athens could buy a probably rather small book-scroll, containing exactly the second part(s) of Anaxagoras' book, paying only one drachma for it and so be able to study just those

[16] Kirk-Raven 1957: 365–366.

controversial and much discussed opinions of Anaxagoras about τὰ μετέωρα and related topics in which they were especially interested.

It remains to consider the date of publication of Anaxagoras' famous work on physics. We learn from Arist.[17] that 'Αναξαγόρας δὲ ὁ Κλαζομένιος τῇ μὲν ἡλικίᾳ πρότερος ὢν τούτου (sc. Emped.), τοῖς δ' ἔργοις ὕστερος. The meaning of the word ὕστερος is ambiguous, and it has been much disputed whether Aristotle used the word here in a temporal sense, "later", or in a value sense, "inferior". Obviously, this cannot be objectively decided. On the one hand, considering that πρότερος in the first term has a temporal reference it may be that ὕστερος is used in the same sense; on the other hand, there is perhaps a strain of valuation in the subsequent lines, where he interprets the element doctrine of Anaxagoras, seeing that Aristotle preferred the four-element model of Empedocles to the infinitesimal theory of Anaxagoras. However, neither of these aspects is clear enough to be decisive.

The tradition that Anaxagoras was older than Empedocles is also found in Simpl.,[18] whose source was Theoph., *Phys. Opin.:* 'Εμπεδοκλῆς ὁ 'Ακραγαντῖνος οὐ πολὺ κατόπιν τοῦ 'Αναξαγόρου γεγονώς. This tradition of the relative dates of the two philosophers seems trustworthy,[19] and there is nothing to show that Aristotle's statement that Anaxagoras was later τοῖς ἔργοις should *not* mean that he published his doctrine after Empedocles. The meaning of ὕστερος need not be disjunctively *either* temporal *or* moral. Aristotle may well have used the word ambiguously in both senses at the same time.

Knowledge of the relative dates when contemporary philosophers published their doctrines is of course essential to the understanding of the development of thought. But unfortunately our knowledge of such dates is rather uncertain, not only as regards Empedocles and Anaxagoras, but also Zeno of Elea, whose relationship to Anaxagoras is of great importance, the general opinion being that Zeno, although being born about 490–485 B.C., published his paradoxes before Anaxagoras wrote his book.[20]

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[17] *Metaph.* 984 a 11 (DK 59 A 43).

[18] *In Phys.* 25, 19 (DK 59 A 8).

[19] The exact date of Empedocles' birth is not known but was possibly in the latter part of the 490ies.

[20] The most trustworthy source of the date of Zeno's writings is Plat. who *Parm.* 128 D (DK 29 A 12) represents Zeno as saying that his book διὰ τοιαύτην δὴ φιλονικίαν ὑπὸ νέου ὄντος ἐμοῦ ἐγράφη.

Because of the indecisive and insufficient external evidence, we are thrown upon the internal evidence of the texts themselves for relating the doctrine of one thinker to that of another on logical grounds. A further discussion of these questions follows below, pp. 70–71.

THE SOURCES

In reconstructing the doctrine of a thinker whose works are lost, the crucial question is how to evaluate the sources. Since the late nineteenth century, a distinction has been upheld between the two categories of sources that exist, (1) fragments, i.e. authentic parts of works now lost, and (2) testimonia, i.e. accounts or abstracts of (parts of) the content of the doctrines of the works in question.

Two main problems present themselves to anyone who tries to reconstruct the thoughts of an author whose works are lost, (1) the reliability of the remaining fragments and (2) their relationship to the testimonia. We will discuss the two problems shortly in the following.

We only possess about twenty fragments of Anaxagoras' book on Nature.[21] Nearly all of these have been preserved by Simplicius in his commentaries on Aristotle. However, these few fragments of Anaxagoras' work can most probably be regarded as containing the fundamentals of his philosophy.

It has been disputed whether Simplicius actually possessed Anaxagoras' book or not. Diels, *Dox.* (1879: 112) maintained that he possessed the work of Anaxagoras as well as those of many other Pre-Socratics, and this opinion has prevailed ever since.[22] This is only natural because, judging from the way Simplicius quotes the Pre-Socratics, Anaxagoras[23] as well as Zeno,[24] Melissus,[25] and Empedocles,[26] it seems

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[21] The book is called Περὶ φύσεως (Simpl. *In Phys.* 34, 29) or Τὰ φυσικά (Id. 155, 21; Athen. *Epit.* B, 57d=DK 59 B 22).

[22] For example, Raven in Kirk-Raven (1957: 366, n. 1) does not even take up the question whether Simpl. actually had access to Anaxagoras' book, and Guthrie (1965: 269) takes it for granted that "A copy was still available to Simplicius in the sixth century A.D."

[23] Simpl. *In Phys.* 155, 23–30 and 34, 28 (DK 59 B 1–B 2).

[24] Simpl. *In Phys.* 139, 5 and 140, 27 (DK 29 B 1–B 3).

[25] Simpl. *In Phys.* 111, 15–19 (DK 30 B 7).

[26] Simpl. *In Phys.* 157, 25–27 (DK 31 B 17).

quite probable that he was actually extracting directly from the books of these authors. And the wordings of Simplicius in quoting Diogenes of Apollonia[27] appear to be sufficiently clear to show that he actually read a copy of Diogenes' book.

It would seem, then, that we should conclude that Simplicius did have a number of Pre-Socratic works at his disposition. Nevertheless, there have been doubts about this. For example, Lanza (1963: 289 n. 66) suggests that Simplicius may have found the Anaxagorean fragments in a section of the Φυσικῶν δόξαι by Theophrastus dedicated to the ἀρχαί.

That Simplicius used Theophrastus' work is clear,[28] but it cannot be shown that he actually found the Pre-Socratic quotations there.

An extreme position is taken by Gershenson-Greenberg (1964: 370–372) who assert without hesitation that Simplicius did not have Anaxagoras' book and argue that the book was lost very early, "perhaps as far back as the third century B.C." (p. 377) and that the "so-called fragments" (p. 378), as they call them, were found by Simplicius in "handbooks circulated containing certain passages selected from Anaxagoras' book, or chosen from among anonymous quotations and attributed by scholars to Anaxagoras, or reconstructed on the basis of Aristotle's account to resemble Anaxagoras' diction and style."

To reach this extreme conclusion, the authors present an account of passages which are alleged to prove the inauthenticity of the fragments. The account consists of a collection of small variations in citation (pp. 359–360), a number of quotations the beginning and end of which can be disputed, a list of interpolations, and so on. The argumentation is not decisive; in parts it is futile. Such are almost all the adduced small variations of citation, e.g. presence or absence or substitution of particles or articles, paleographic or formal/dialectal variations,[29] omissions of words or reversions of word-order, etc.

Of course, such variations have no value as arguments against authenticity. Paleographic variation in small details of the text is

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[27] *In Phys.* 151, 28 ἐν δέ γε τῷ Περὶ φύσεως, ὃ τῶν αὐτοῦ μόνον εἰς ἐμὲ ἦλθε, προτίθεται μὲν διὰ πολλῶν δεῖξαι ὅτι ἐν τῇ ὑπ' αὐτοῦ τεθείσῃ ἀρχῇ ἐστι νόησις πολλή. γράφει δὲ εὐθὺς μετὰ τὸ προοίμιον τάδε. Another evident passage is *In Phys.* 25, 6 καὶ ταῦτα μὲν Θεόφραστος ἱστορεῖ περὶ τοῦ Διογένους, καὶ τὸ εἰς ἐμὲ ἐλθὸν αὐτοῦ σύγγραμμα Περὶ φύσεως ἐπιγεγραμμένον κτλ.

[28] Cf. *In Phys.* 9, 7; 20, 19; 21, 10; 26, 7; 27, 11.

[29] E.g. ἓν εἶναι : ἐνεῖναι, οὐδέν : οὐδέ, σμικρότητα : μικρότητα, ὅσα : ἄσσα, ἠέλιον : ἥλιον, αὐτοῖσιν : αὐτοῖς, ἐφ' ἑαυτοῦ : ἐπ' ἐωυτοῦ, etc.

irrelevant, formal variation of the type σμικρόρης: μικρότης, ἁπάντων: πάντων is insignificant, and variation in word-order is a natural consequence of citation from memory, which was exceedingly common.[30]

The general assertion made p. 360[31] is only applicable to a few passages,[32] and the choice among alternative forms is usually quite easy to make. To take one example, it requires no discussion to establish that ἐνεῖναι is the correct reading, not ἓν εἶναι, considering the context.[33]

Gershenson-Greenberg (p. 360) find it difficult to decide whether or not the phrase *In Phys.* 175, 11–12 and 176, 24–25 in which the words πλὴν νοῦ are left out is a separate passage from 157, 1–2 where these words are quoted. But the decision is not difficult and was made correctly by Diels: it is one and the same passage. And the reason why Simplicius left out πλὴν νοῦ in 175, 11–12 and 176, 24–25 is obviously that he discussed here not Νοῦς but the inseparability of matter in Anaxagoras' doctrine, which he finds paradoxical in view of Anaxagoras' statements about ἀπόκρισις, which Simplicius is studying in these passages.

To sum up, the inauthenticity of the Anaxagorean fragments has not been shown by Gershenson-Greenberg, nor can it possibly be by anyone. There will be no change in the general opinion held since the nineteenth century that the quotations of Anaxagoras made by Simplicius are the most reliable sources of our knowledge of his doctrine.

As to the question whether Simplicius possessed a copy of the philosopher's book or not, it is far from being a "fact that Simplicius did not have Anaxagoras' book" (l.c., p. 370). The silence of Plinius the Elder and Diogenes Laertius about the book is no proof against its existence in their time. And "Simplicius' partial ignorance of Anax-

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[30] Cf. Rösler 1971: 247. Rösler (p. 248, n. 1) points out that Simplicius clearly demonstrates his endeavour to let the Pre-Socratics themselves express their doctrines with their own words.

[31] "We do not have carefully worded direct quotations from Anaxagoras in the text of Simplicius, and any claim for one reading over another is entirely arbitrary."

[32] *In Phys.* 35, 4–8, and 157, 12–16, which is a long quotation and was probably looked up by Simplicius, show the following variations: συνῳκημένας : συνημμένας, ἠέλιον : ἥλιον, αὐτοῖσιν εἶναι : αὐτοῖς ἐνεῖναι. The last two variations are insignificant, while the first may seem more difficult to explain but is also probably due to paleographic confusion. DK chose the form συνῳκημένας, but perhaps this had arisen through a misreading by a copyist of the more unusual συνημμένας.

[33] *In Phys.* 35, 1, and 157, 9 ἐνεῖναι ... ἐν πᾶσι τοῖς συγκρινομένοις.

agoras' work and thought" (p. 371) suggests only that he did not dispose of the whole work.

Fortunately, it is not decisive for the value of Simplicius' quotations whether he actually had the book or not. Their status of authentic fragments is not much detracted from if he found them in Theophrastus' Φυσικῶν δόξαι, as Lanza (1963) thinks he did. And that he found them in such an early source is much more probable that the suggestion of a late doxographic work as his source, which Gershenson-Greenberg make. Further, the fact that Simplicius quotes only part of Anaxagoras' work is no proof against his having just one – possibly the first – part of the book, nor against his quoting an early source as Theophrastus.

We should conclude, then, that Simplicius either used a copy of (part of) Anaxagoras' book or Theophrastus' Φυσικῶν δόξαι, i.e. an old, early source, for his quotations of Anaxagoras, and that the fragments can be considered tolerably reliable.

The second problem in the evaluation of the sources is the relationships between the fragments and the other sources, i.e. the testimonia. How reliable are the accounts and discussions of Anaxagoras' doctrine that are found in Plato and Aristotle? What import should be ascribed to the fact that these sources are so early and certainly represent a direct – verbal and literary – tradition? How important is the fact that these early sources never present a literal quotation of Anaxagoras' text? This has of old been considered decisive: since the proper words of the author are not quoted, the evidence value of such sources should be considered secondary to that of the fragments, even if they be of early date.

Gershenson-Greenberg, however, totally ignore the traditional distinction between fragments and testimonia and propose (p. 329) rigorous conditions to be fulfilled before a source can be trusted.[34] Accor-

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[34] "A trustworthy secondary source for the scientific theories of Anaxagoras should fulfill both of the following conditions: (1) its author should have been a student of Anaxagoras or should have heard his theories from others who had studied with him *and* he should have read his writings carefully; failing that, its author should have *either* read the writings of Anaxagoras, *or* been in a position to hear the views of Anaxagoras expressed by those who preserved a direct tradition of these views; (2) the picture it presents of Anaxagoras' theory should be free from internal contradictions. If a source fulfills neither of these conditions, it must a priori be considered inadmissible as evidence".

ding to the authors, only the early sources of the fourth century B.C., Aristotle holding the first place,[35] are trustworthy, irrespective of the fact that they do not offer quotations proper but merely accounts and discussions of the doctrine of Anaxagoras. Thus, Gershenson-Greenberg carry through their reconstruction of Anaxagoras' doctrine virtually without reference to the late sources, above all Simplicius, which offer fragments of Anaxagoras' book. Considering that it has not been shown that the fragments are not authentic, this is methodically unacceptable.

Now, Gershenson-Greenberg seem to have been successful in reconstructing Anaxagoras' system of thought; his doctrine appears to be impressively coherent and logical. It would seem that the interpretation is correct but, unfortunately, it is probably not. Through the unjustified elimination of the fragments the authors have made their task considerably more easy. Consequently, their interpretation is certainly incomplete and, as such, probably not correct. Thus, they have not taken into consideration that Anaxagoras expressly mentions[36] ἀήρ, αἰθήρ, and γῆ as discrete entities present in the primordial stage, on the same level as the opposite qualities and the σπέρματα.[37] And this important term, used by Anaxagoras as a cosmological-physiological term in frag. 4, was only once used by Arist. in such a sense,[38] but evidently not in the same sense as Anaxagoras used it. Through their negligance of the fragments, Gershenson-Greenberg were able to avoid this crucial problem and so translate this instance of the term in Arist. loosely, "particle".[39] This is also a remarkable translation with regard to the fact that Aristotle obviously uses σπέρματα as a synonym for ὁμοιομερῆ to denote Anaxagoras' alleged elements. The latter term is, however, rendered "molecule" by Gershenson-Greenberg.

It seems, however, that Aristotle avoided the term σπέρματα and used ὁμοιομερῆ instead, which probably had some consequences for

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[35] The first to take this position, and even more extremely, was F. Breier 1840 (Gershenson-Greenberg 1964: 391–392).

[36] DK 59 B 1, B 2, B 4.

[37] See frag. 4, the latter section.

[38] *De caelo* 302 a 31 'Αναξαγόρας δὲ τοὐναντίον· τὰ γὰρ ὁμοιομερῆ στοιχεῖα, (λέγω δ' οἷον σάρκα καὶ ὀστοῦν καὶ τῶν τοιούτων ἕκαστον)· ἀέρα δὲ καὶ πῦρ μείγματα τούτων καὶ τῶν ἄλλων σπερμάτων πάντων· εἶναι γὰρ ἑκάτερον αὐτῶν ἐξ ἀοράτων ὁμοιομερῶν πάντων ἠθροισμένον.

[39] P. 70, Source 31.

his interpretation of Anaxagoras' doctrine, and certainly had for the interpretation made by Gershenson-Greenberg. Aristotle, in any case, used Anaxagoras' book while Gershenson-Greenberg refused to use even the few fragments of it now restant. Gershenson-Greenberg have produced much useful criticism of works on Anaxagoras but, unfortunately, the position taken is to the extreme.

The opposite, more or less extreme, position in valuing the sources of Anaxagoras has been taken by almost all scholars. The first to emphasize the evidence of the fragments, while depreciating early sources, especially Aristotle, was Tannery [1887] who stigmatized the term ὁμοιομερῆ as being "inventé par Aristote" (p. 297) and established that "dire avec Aristote che le feu est constitué de particules *homéomères*, semblables à celles de la chair ou des os, c'est évidemment défigurer du tout au tout la pensée du Clazoménien" (p. 297). Tannery relies entirely on "les fragments du Clazoménien, dont... l'authenticité n'est sugette à aucun doute" (p. 298).

This view has prevailed ever since, with few exceptions and limitations. The work of Gershenson-Greenberg is a unique attempt at a radically different approach. But there are valid historical and philological objections against such a simplification. Cherniss' (1935: 347) characterization of the attitude of Aristotle towards his predecessors is essentially correct: "There are no 'doxographical' accounts in the works of Aristotle, because Aristotle was not a doxographer but a philosopher seeking to construct a complete and final philosophy. For him – and for every philosopher – the doctrines of his predecessors were materials to be remoulded for his own purpose; in their new form they can be of use to the historian of philosophy only if Aristotle's process of interpretation can be reversed so as to regenerate them in the form they had before Aristotle employed them as his material."

If a historian of Pre-Socratic philosophy takes a sceptic position towards Aristotle as a source of his philosophy, this does not mean a depreciation of Aristotle as a writer and philosopher: he did not intend to present full and exact accounts of the doctrines of his predecessors. Albeit that Cherniss sometimes exaggerates the unreliability of Aristotle as a source, the fact remains that he often distorts the doctrines of the old in his argumentations. Lanza[40] points out that it is possible to discern two stages in Aristotle's argumentations on the basis of earlier doctrines. First he presents these, using his own terms and concepts,

[40] 1966: Introduzione, p. VI–VII.

and proposes identifications,[41] not as certain but probable; then, in his argumentation, he becomes apodictic and the identifications lose every uncertainty and become parts of the argumentation.[42]

Lanza concludes (1966: VII) that "la citazione perde così qualsiasi valore storico". This is certainly too categorical a position, as is that taken by Gershenson-Greenberg. Neither Aristotle (and other early sources), nor the Anaxagorean fragments should be eliminated; on the contrary, both are valuable for the reconstruction. The more or less distorted reports offered by Aristotle and other testimonial sources must be taken into consideration and, as far as possible, either be brought to harmonize with the content of the fragments or be shown to be distortions of Anaxagoras' intentions.

Lanza (1963) made a valuable analysis of the doxographic tradition of Anaxagoras, using the term ὁμοιομέρεια as a criterion. The word is not found in Aristotle, nor in the fragments, while it is current in Anaxagorean doxography. Simplicius uses it abundantly. The earliest instance of the word is found in an Epicurean fragment,[43] where it seems to mean "similarity".

The noun corresponds to the adjective ὁμοιομερής. This is first found in Aristotle who uses it to denote homogeneous – in Aristotle's eyes – substances, above all living tissues but also, for example, metals, whose parts are like the whole.[44] Aristotle uses the word in his description of Anaxagoras' theory of matter,[45] and ever since these two words, ὁμοιομερής and ὁμοιομέρεια, have been an essential feature in discussions of Anaxagoras' philosophy, in Antiquity as well as in modern times.

The adjective is perhaps primary to the noun, and through its

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[41] E.g., De *caelo* 302 a 28 (DK 59 A 43), where the Anaxagorean concepts of αἰθήρ and σπέρματα are identified with πῦρ and ὁμοιομερῆ respectively.

[42] C.f., e.g., *Phys.* 187 a 20–188 a 18.

[43] 27, 27, 7 ed. Arighetti 1960. Other instances, 23, 33, 2; and 28, 7, 5, are so fragmentary as to be insignificant.

[44] *Meteor.* 388 a 13 λέγω δ' ὁμοιομερῆ τά τε μεταλλευόμενα, οἷον χρυσόν, χαλκόν, ἄργυρον, καττίτερον, σιδηρόν, λίθον, καὶ τἆλλα τὰ τοιαῦτα, καὶ ὅσα ἐκ τούτων γίγνεται ἐκκρινόμενα, καὶ τὰ ἐν τοῖς ζῴοις καὶ φυτοῖς, οἷον σάρκες, ὀστᾶ, νεῦρον, δέρμα, σπλάγχνον, τρίχες, ἶνες, φλέβες, ἐξ ὧν συνέστηκε τὰ ἀνομοιομερῆ, οἷον πρόσωπον, χείρ, πούς, καὶ τἆλλα τὰ τοιαῦτα, καὶ ἐν φυτοῖς ξύλον, φλοιός, φύλλον, ῥίζα, καὶ ὅσα τοιαῦτα.

[45] E.g., *Metaph.* 984 a 11 and *De caelo* 302 a 28 (DK 59 A 43); *Phys.* 203 a 19 (DK 59 A 45); *De gen. et corr.* 314 a 18 (DK 59 A 46).

abstract meaning the corresponding noun was naturally an abstract one denoting "similarity (in all parts)". Thus, it originally only occurs in the singular; the plural form is first found in Plutarchus, were it is used in a clearly concrete sense, evidently meaning "particles".[46] Lucretius, using only the singular form, designates by means of this term the main principle of Anaxagoras' theory of matter, the infinite divisibility of matter into homoeomerous parts, i.e. parts similar to each other because they all contain something of everything.[47] However, even in Lucretius' description of this theory there is tacitly present or latent a conception of particles as constituents of substances.[48] From Aetius onwards, this concept is an integral part of the doxographic tradition of Anaxagoras.[49]

It is evident, then, that the doctrine of Anaxagoras had been contaminated with the Atomistic one. The first real contact between the two doctrines is likely to have been made at Lampsacus, possibly in the school of Nausiphanes where Epicurus is known to have studied.[50] Initially, the term ὁμοιομέρεια may have been used to label the typical feature of the Anaxagorean physical theory, the infinite divisibility of matter. But the origin of the noun remains uncertain;[51] perhaps it was forged in the Epicurean school as the outcome of the study of Anaxagoras' doctrine and Aristotle's criticism. To judge from Lucretius,[52] the Epicureans seem to have preserved their original view of Anaxagoras' philosophy down to the 1st century B.C. But at that time the altered interpretation of his doctrine, the Atomistic contamination, had probably already occurred.

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[46] *Per.* 4, 4 (DK 59 A 15); *De plac. philos.* 1, 3.

[47] Lucr. *De rerum nat.* I 830 ff. (DK 59 A 44) nunc et Anaxagorae scrutemur homoeomerian, quam Grai memorant nec nostra dicere lingua concedit nobis patrii sermonis egestas, sed tamen ipsam rem facilest exponere verbis. principio, rerum quam dicit homoeomerian ... nec tamen esse ulla de parte in rebus inane concedit neque corporibus finem esse secandis. This meaning of the singular ὁμοιομέρεια recurs in Philo, *De prov.* 1, 22.

[48] This concept is also found in Cic. *Acad.* pr. II 37, 118 (DK 59 A 49) Anaxagoras materiam infinitam, sed ex ea particulas similes inter se minutas; eas primum confusas postea in ordinem adductas mente divina.

[49] Aet. I 3, 5 (DK 59 A 46); Justin. Martyr, *Cohort. ad gen.* 3; Sext. *Pyrrh. instit.* 3, 22; Alex. Aphrodis. *De mixt.* 214, 1 and 27; Idem, *In De sensu* 64, 11; Stob. *Ecl. phys.* I, 10, 12; Simpl. *In Phys.* 154, 4 *et passim.*

[50] DK 75 A 1–9. Cf. Lanza 1963: 285.

[51] Lanza (1963: 284) supposes that the noun was derived from the adjective.

[52] See above, footnote 47.

Lanza (1963: 286–289) rightly argues that this contamination of Anaxagoras' doctrine by the Atomistic one probably took place in the syncretistic intellectual environment which produced that known doxography that Diels[53] called *Vetusta Placita*.[54] Even Empedocles was bundled together with Anaxagoras and the Atomists.[55] From that time (1st c. B.C.) onwards, the doxographic tradition of Anaxagoras was hopelessly confused.

Such a far-reaching remodelling of the doctrines of these Pre-Socratics presupposes that their own works were not used by the writer of the *Vetusta Placita* (and the following doxographers). Precisely this fact is never discussed by Lanza, but rather whether Theophrastus was used or not. Diels has demonstrated that the *Vetusta Placita* depended on Theophrastus to a certain extent, especially regarding the Ionian philosophers and the Eleatics, but less clearly concerning the Atomists. For Empedocles and Anaxagoras it cannot be shown that Theophrastus was used. Lanza establishes (p. 287) that the arbitrary extension of the Atomistic conception cannot possibly derive from Theophrastus as a source.[56] Thus, it seems to be derivable from Atomistic sources exclusively. However, the particle conception in the doxographic tradition of Anaxagoras is also traceable back to Aristotle; see below, pp. 73–74.

For the *Vetusta Placita* in general there is a striking negligence of primary sources. The non-use of the works of a philosopher in describing his doctrine is then no proof of their non-existence. Such indolence on the part of the doxographers was common in Antiquity. It is then the more remarkable that the bulk of authentic Pre-Socratic text fragments is found in the 6th century writer Simplicius. But not even Simplicius is able to detach himself entirely from the doxographic

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[53] *Dox.*, p. 181 ff.

[54] Lanza (1963: 287) surmises that this might have been the school of Posidonius or a similar syncretistic circle.

[55] Aet. I 24, 2 (Diels, *Dox.*, p. 326): Ἐμπεδοκλῆς Ἀναξαγόρας Δημόκριτος Ἐπίκουρος καὶ πάντες ὅσοι κατὰ συναθροισμὸν τῶν λεπτομερῶν σωμάτων κοσμοποιοῦσι συγκρίσεις μὲν καὶ διακρίσεις εἰσάγουσι, γενέσεις δὲ καὶ φθορὰς οὐ κυρίως· οὐ γὰρ κατὰ τὸ ποιὸν ἐξ ἀλλοιώσεως, κατὰ δὲ τὸ ποσὸν ἐκ συναθροισμοῦ ταύτας γίνεσθαι. In Aet. I 13, 1 Empedocles is made an Atomist and the term ὁμοιομερῆ is used to denote his Atomistic particles: Ἐμπεδοκλῆς πρὸ τῶν τεττάρων στοιχείων θραύσματα ἐλάχιστα οἱονεὶ στοιχεῖα πρὶν στοιχείων ὁμοιομερῆ. Even clearer: I 17, 3 Ἐμπεδοκλῆς δὲ ἐκ μικροτέρων ὄγκων τὰ στοιχεῖα συγκρίνει, ἅπερ ἐστὶν ἐλάχιστα καὶ οἱονεὶ στοιχεῖα στοιχείων.

[56] This is also argued by Schofield 1975: 4–5.

tradition – which can certainly not be expected – but feels obliged to make efforts to harmonize the doxography with the authentic Pre-Socratic texts.[57] This dilemma was especially difficult with regard to Anaxagoras because his doctrine had been so grotesquely distorted.

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[57] Cf. Lanza 1963: 265 "Anche se egli (sc. Simpl.) aveva dinanzi a sé il testo integro di Anassagora, ciò non gli poteva impedire un'interpretazione parziale e gravemente distorta"; and p. 266 "Se dunque Simplicio supera in gran parte questo schematismo da prontuario, resta tuttavia saldamente inserito in quella tradizione di 'utilizzazione' della storia della filosofia ch'era stata inaugurata dallo stesso Aristotele".

THE DOCTRINE AND ITS INTERPRETATIONS

There is evidence that Anaxagoras did not only present a theory of matter and one of cosmogony, but also that he dealt with special problems, such as sense perception and cognition, astronomical and meteorological questions, biological problems, etc. In this study, only the general theories, those of matter and cosmogony, will be treated. All the fragments, except fr. 10, of this section of Anaxagoras' book are quoted by Simplicius. Considering that this painstaking commentator made strenuous efforts to find out what Anaxagoras himself had to say, we are entitled to posit that Simplicius did not overlook or disregard any essential thoughts in the doctrine, if available to him.[58] There is therefore good reason to suppose that those principles which we are able to trace in the fragments actually form the integrate core of his philosophy.

The Fundamental Principles

Anaxagoras began his book with these words (B 1): 'Ομοῦ χρήματα πάντα[59] ἦν, ἄπειρα καὶ πλῆθος καὶ σμικρότητα.

In these few words Anaxagoras presented all but one of the fundamental principles of his theory of matter. The ideas concentrated in this short sentence are expounded further in other fragments.

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[58] This is also valid in case he found the Anaxagorean fragments in Theophrastus.

[59] This word-order occurs only in Simpl. *In Phys.* 155, 26 but is rightly accepted by Rösler (1971: 247) as the probably correct one. The singleness of the order χρήματα πάντα – as against the common traditional πάντα χρήματα (e.g. Plat., Arist., Diog., Plut.) – is looked upon by Rösler (l.c.) as an indication that Simplicius actually wrote down the rather long quotation of B 1 from Anaxagoras' book, while he only memorized the traditional πάντα χρήματα elsewhere (34, 20; 172, 2).

There are five principles expressed in the first sentence, namely

(1) That which exists *has not come into being* (nor shall anything perish).[60]

(2) That which exists is[61] *many*, not one; Anaxagoras uses the plural πάντα instead of the Eleatic πᾶν.

(3) That which exists is *together* (ὁμοῦ).[62] All that exists is inseparable;[63] which is in turn due to Anaxagoras' next principle, namely

(4) That which exists is *infinitely divisible*, which is emphatically stressed in the second and third sentences of B 1 καὶ γὰρ τὸ σμικρὸν ἄπειρον ἦν· καὶ πάντων ὁμοῦ ἐόντων οὐδὲν ἔνδηλον ἦν ὑπὸ σμικρότητος.[64]

(5) Finally there is a fifth principle that is already expressed in this first sentence of Anaxagoras' book, the principle of *infinity*. This is stated as valid with respect to multitude or quantity (πλῆθος) and divisibility (σμικρότητα) quite generally for everything (πάντα χρήματα), and specifically for ἀὴρ καὶ αἰθήρ (B1 end), τὸ περιέχον (B2), and σπέρματα (B4 end).

(6) A sixth principle is found in B12 end, which can be called the principle of *predominance:* ὅτων πλεῖστα ἔνι, ταῦτα ἐνδηλότατα ἓν ἕκαστόν ἐστι καὶ ἦν, each thing is essentially that of which there is a predominance in it.

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[60] The verb is εἶναι, not γίγνεσθαι, and that there is no perishing is logically to expect; this is also stated explicitly in B 17: τὸ δὲ γίνεσθαι καὶ ἀπόλλυσθαι οὐκ ὀρθῶς νομίζουσιν οἱ Ἕλληνες· οὐδὲν γὰρ χρῆμα γίνεται οὐδὲ ἀπόλλυται κτλ.

[61] The plurality of course still exists; cf. the fragments *passim.*

[62] That this is still valid is made clear in fragment B 6 ὅπωσπερ ἀρχὴν εἶναι καὶ νῦν πάντα ὁμοῦ.

[63] This is explicitly stated in B 8 οὐ κεχώρισται ἀλλήλων τὰ ἐν τῷ ἑνὶ κόσμῳ οὐδὲ ἀποκέκοπται πελέκει οὔτε τὸ θερμὸν ἀπὸ τοῦ ψυχροῦ οὔτε τὸ ψυχρὸν ἀπὸ τοῦ θερμοῦ, and B 6 οὐδὲ χωρὶς ἔστιν εἶναι, ἀλλὰ πάντα παντὸς μοῖραν μετέχει . . . οὐκ ἂν δύναιτο χωρισθῆναι, οὐδ' ἂν ἐφ' ἑαυτοῦ γενέσθαι. The same idea is also expressed repeatedly otherwise: B 4 (at the end) ἐν τῷ σύμπαντι χρὴ δοκεῖν ἐνεῖναι πάντα χρήματα, B 6 ἐν πᾶσι δὲ πολλὰ ἔνεστι, B 11 ἐν παντὶ παντὸς μοῖρα ἔνεστι πλὴν νοῦ, B 12 τὰ μὲν ἄλλα παντὸς μοῖραν μετέχει . . . ἐν παντὶ γὰρ παντὸς μοῖρα ἔνεστιν.

[64] The principle of infinite divisibility is most clearly expressed in B 3: οὔτε γὰρ τοῦ σμικροῦ ἐστι τό γε ἐλάχιστον, ἀλλ' ἔλασσον ἀεί (τὸ γὰρ ἐὸν οὐκ ἔστι τομῇ⟨μὴ⟩ οὐκ εἶναι) κτλ. (for the reading, see below, p. 72, n. 151). In B 6 the principle of infinite divisibility is explicitly stated as the cause of the permanent ὁμοῦ-state of things: ὅτε τοὐλάχιστον μὴ ἔστιν εἶναι, οὐκ ἂν δύναιτο χωρισθῆναι κτλ. It can be concluded from these passages that Anaxagoras denied the existence of the void (τὸ κενόν), and this is also confirmed by Arist. *Phys.* 213 a 22 (DK 59 A 68) and *Probl.* 914 b 9 (DK 59 A 69).

The ὁμοιομερῆ *Versus* the Opposites

These six principles have been generally accepted as Anaxagoras' own. The doctrine appears to have been presented quite clearly by the Clazomenian himself and thus would seem to be indisputable. But practically all interpretors, beginning with Aristotle, have found it more or less problematic,[65] some of them even absurd.[66] This is not surprising because Anaxagoras' philosophy is certainly not easy to interpret. We shall examine some interpretations which can be considered typical and representative of the various methods of approach to his thought and try to judge if some model can be considered plausible. Finally we shall see if Anaxagoras' theory can be given a new – and perhaps better – interpretation.

It is appropriate to begin with Aristotle, whose interpretation introduced the concept of homoeomereity into the discussion of the philosophy of the Clazomenian.

Whether Anaxagoras himself used the word ὁμοιομέρεια and/or ὁμοιομερής cannot be shown. The strongest indication against his having used one or both of them is the fact that Simplicius seems not to have been able to find a passage in (or: from) his work containing these words. This is strong counter-evidence indeed, because Simplicius seems to have been eagerly searching for passages from Anaxagoras' own text that could confirm the Aristotelic presentation of his doctrine. The great number of quotations of Pre-Socratics made by Simplicius suggests that he, unlike other commentators, actually made strong efforts to solve the difficult task of finding out the true meaning of Anaxagoras' philosophy. But he was not successful. The problem of harmonizing the doxographic tradition of Anaxagoras' theory with the content of his own fragments is still discussed today.

Our first subject of discussion, then, shall be the question of the origin of the terms ὁμοιομερής and ὁμοιομέρεια in the Anaxagorean tradition. Is the adjective (first found in Arist.) or the noun (first found in Epicur.) primary? Aristotle uses ὁμοιομερής when speaking of

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[65] There are a few exceptions, for example, Cleve 1965 and Gershenson-Greenberg 1964.

[66] For example, Brieger (1901), Capelle (1919), Gomperz (1922[4]). A representative of this view in Antiquity is the scholiast *In Gregor.* XXXVI 911 Migne (DK 59 B 10): ἐλήρει γὰρ ἀλλήλοις μὲν μεμῖχθαι πάντα κτλ.

Anaxagoras' doctrine but he defines the term[67] without any reference to or connection with Anaxagoras. The term is thus generally regarded as invented by Aristotle himself for his own purposes of description and classification.[68] This is clearly seen when he discusses Anaxagoras' doctrine; he uses the term as already available. A typical example of how he does this is found in *Metaph.* 954 a 11 and *De caelo* 302 a 28 (DK 59 A 43). Aristotle here compares and contrasts Anaxagoras and Empedocles very effectively:

'Αναξαγόρας δ' ὁ Κλαζομένιος τῇ μὲν ἡλικίᾳ πρότερος ὢν τούτου (sc. Emped.), τοῖς δ' ἔργοις ὕστερος, ἀπείρους εἶναί φησι τὰς ἀρχάς. σχεδὸν γὰρ ἅπαντα τὰ ὁμοιομερῆ (καθάπερ ὕδωρ ἢ πῦρ) οὕτω γίγνεσθαι καὶ ἀπόλλυσθαί φησι συγκρίσει καὶ διακρίσει μόνον, ἄλλως δ' οὔτε γίγνεσθαι οὔτ' ἀπόλλυσθαι, ἀλλὰ διαμένειν ἀίδια.

Further (*De caelo,* l.c.) 'Αναξαγόρας δ' 'Εμπεδοκλεῖ ἐναντίως λέγει περὶ τῶν στοιχείων. ὁ μὲν γὰρ πῦρ καὶ τὰ σύστοιχα τούτοις στοιχεῖά φησιν εἶναι τῶν σωμάτων καὶ συγκεῖσθαι πάντ' ἐκ τούτων, 'Αναξαγόρας δὲ τοὐναντίον· τὰ γὰρ ὁμοιομερῆ στοιχεῖα, λέγω δ' οἷον σάρκα καὶ ὀστοῦν καὶ τῶν τοιούτων ἕκαστον· ἀέρα δὲ καὶ πῦρ μείγματα τούτων καὶ τῶν ἄλλων σπερμάτων πάντων· εἶναι γὰρ ἑκάτερον αὐτῶν ἐξ ἀοράτων ὁμοιομερῶν πάντων ἠθροισμένον. διὸ καὶ γίγνεσθαι πάντ' ἐκ τούτων· τὸ γὰρ πῦρ καὶ τὸν αἰθέρα προσαγορεύει ταὐτό.

We shall see to what extent this description is verified by the fragments. First, Aristotle stresses one of the fundamental principles of Anaxagoras, namely that there is not a limited number of elements of which the world is built up. In B 1 Anaxagoras makes the statement about the χρήματα that they are ἄπειρα πλῆθος and in B 4 end he says the same of the σπέρματα.

Another point in Aristotle's description that is verified by the fragments is Anaxagoras' basic thought that there is no becoming and no perishing of things; everything exists as such in the primordial (pre-cosmic) stage.[69]

The processes of σύμμιξις (or σύγκρισις (B 4)) and διάκρισις are well attested in the fragments (B 4, B 5, B 12, B 13). This is also true of

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[67] *Meteor.* 388 a 13, see above, p. 19, n. 44.

[68] The way of classification as such is already found in Plat. *Prot.* 329 D. Cf. Cornford (1930: 16, n. 4) who surmises that even the term ὁμοιομερής may have existed at Plato's times.

[69] B 17; cf. above, p. 24, n. 60.

the terms ἀήρ and αἰθήρ (B 1, B 2, B 15); and the term σπέρμα is found twice in B 4.

Aristotle interprets αἰθήρ as a synonym of πῦρ, which is generally thought to be right, although it may be that Anaxagoras chose this term deliberately instead of πῦρ to mark a difference of conception. However, it cannot possibly mean anything but the most subtle and fine substance in the world. In any case, this is of limited importance for the understanding of the system as a whole. Of the greatest importance, however, is the interpretation of the term σπέρμα. Aristotle (*De caelo,* l.c.) takes it to be synonymous with his own ὁμοιομερῆ, natural substances. This interpretation cannot be verified by the fragments. Anaxagoras uses the term σπέρμα very vaguely. In the first instance (B 4) he speaks of σπέρματα πάντων χρημάτων, while in the second instance the σπέρματα are themselves said to be χρήματα. Any connection of the term σπέρματα with Aristotelic natural substances is non-existent in the fragments. It seems probable that Aristotle, in the two passages cited above, discusses just the beginning of Anaxagoras' book (B 1, B 2, B 4). Shall we suppose that he could actually read this connection from Anaxagoras' text containing or not containing the term(s) ὁμοιομερής / ὁμοιομέρεια? Or was Anaxagoras so ambiguous on this point that Aristotle felt himself entitled to interpret him in the best way possible – as he apparently did with αἰθήρ? However this may be, it is obvious that Aristotle, in contrasting Empedocles with Anaxagoras – who did not regard the four Empedoclean elements as the only ones –, is likely to have been led on to his interpretation that the natural substances, the ὁμοιομερῆ, were the elements of Anaxagoras. Irrespective of how Anaxagoras expressed himself in stating what he regarded as elemental, Aristotle could hardly but conclude that if πῦρ, ἀήρ, ὕδωρ, and γῆ alone do not compose the natural substances, then these must themselves be elemental. It is thus not very surprising that Aristotle took the Anaxagorean σπέρματα πάντων χρημάτων to mean "the natural substances of things, i.e., his own ὁμοιομερῆ.

We shall now investigate how and to what extent this interpretation by Aristotle has turned out to be fatal to the apprehension of Anaxagoras' theory of matter.

Anaxagoras explicitly and emphatically expresses his principle of ὁμοῦ πάντα.[70] Nothing can exist separately in pure form, but in everything there is something of everything else.

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[70] Called principle (3) above, p. 24; cf. n. 63.

Other points that are indisputable in Anaxagoras' theory of matter are the infinite divisibility and the general principle of infinity.[71]

Now it is well known that, on principle, Aristotle rejected the concept of infinity. Thus, he could of course not accept the Anaxagorean principles of infinite divisibility of matter and everything in everything. On such – of course quite respectable – premises Aristotle offers a devastating refutation of these and represents Anaxagoras' doctrine as regrettably gross and naive.[72] He represents him as an incapable thinker, only able to coin a deplorable theory of matter. Of course Aristotle did not – after having rejected the fundamental principle of infinite divisibility – offer a true representation of Anaxagoras' doctrine, and we may suppose that Aristotle himself was well aware of this; he is not a reporter of his doctrine but a severe critic.

Nevertheless, many commentators, in Antiquity as well as in modern times, have accepted this picture as reflecting Anaxagoras' thought, while many have tried in different ways to save his reputation as a philosopher. For example, Simplicius[73] quotes Alexander of Aphrodisias who supposed that the thesis of πάντα ἐν πᾶσι concerns the sense things only, and not the ἀρχαί, but Simplicius observes that the problem remains unsolved, and he himself admits (173, 15) that he cannot solve it either.

Aristotle's rejection of the concept of infinity and especially infinite

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[71] Cf. above, p. 24.

[72] *Phys.* 187 b 8 Εἰ δὴ τὸ μὲν ἄπειρον ᾗ ἄπειρον ἄγνωστον, τὸ μὲν κατὰ πλῆθος ἢ κατὰ μέγεθος ἄπειρον ἄγνωστον πόσον τι, τὸ δὲ κατ' εἶδος ἄπειρον ἄγνωστον ποιόν τι . . . b 13 ἔτι δ' εἰ ἀνάγκη, οὗ τὸ μόριον ἐνδέχεται ὁπηλικονοῦν εἶναι κατὰ μέγεθος καὶ μικρότητα, καὶ αὐτὸ ἐνδέχεσθαι (λέγω δὲ τῶν τοιούτων τι μορίων, εἰς ὃ ἐνυπάρχον διαιρεῖται τὸ ὅλον), εἰ δὴ ἀδύνατον ζῷον ἢ φυτὸν ὁπηλικονοῦν εἶναι κατὰ μέγεθος καὶ μικρότητα, φανερὸν ὅτι οὐδὲ τῶν μορίων ὁτιοῦν· ἔσται γὰρ τὸ ὅλον ὁμοίως . . . b 23 ἔτι εἰ πάντα μὲν ἐνυπάρχει τὰ τοιαῦτα ἐν ἀλλήλοις καὶ μὴ γίνεται ἀλλ' ἐκκρίνεται ἐνόντα, λέγεται δὲ ἀπὸ τοῦ πλείονος, γίγνεται δὲ ἐξ ὁτουοῦν ὁτιοῦν (οἷον ἐκ σαρκὸς ὕδωρ ἐκκρινόμενον καὶ σὰρξ ἐξ ὕδατος), ἅπαν δὲ σῶμα πεπερασμένον ἀναιρεῖται ὑπὸ σώματος πεπερασμένου, φανερὸν ὅτι οὐκ ἐνδέχεται ἐν ἑκάστῳ ἕκαστον ὑπάρχειν. ἀφαιρεθείσης γὰρ ἐκ τοῦ ὕδατος σαρκός, καὶ πάλιν ἄλλης γενομένης ἐκ τοῦ λοιποῦ ἀποκρίσει, εἰ καὶ ἀεὶ ἐλάττων ἔσται ἡ ἐκκρινομένη, ἀλλ' ὅμως οὐχ ὑπερβαλεῖ μέγεθός τι τῇ μικρότητι. ὥστ' εἰ μὲν στήσεται ἡ ἔκκρισις, οὐχ ἅπαν ἐν παντὶ ἐνέσται (ἐν γὰρ τῷ λοιπῷ ὕδατι οὐκ ἐνυπάξει σάρξ), εἰ δὲ μὴ στήσεται ἀλλ' ἀεὶ ἔξει ἀφαίρεσιν, ἐν πεπερασμένῳ μεγέθει ἴσα πεπερασμένα ἐνέσται ἄπειρα τὸ πλῆθος· τοῦτο δ' ἀδύνατον.

[73] *In Phys.* 173, 8 'Αλλὰ μήποτε, φησὶν 'Αλέξανδρος, οὐκ οὕτως χρὴ τὸν λόγον εὐθύνειν· τὸ γὰρ πάντα ἐν πᾶσι μεμῖχθαι οὐκ ἐπὶ τῶν ἀρχῶν ἴσως ἔλεγεν 'Αναξαγόρας, . . . ἀλλ' ἐν ἑκάστῳ τῶν αἰσθητῶν σωμάτων τῶν ἐκ τῶν ἀρχῶν συγκεκριμένων πάντα ἔλεγε μεμῖχθαι.

divisibility of matter inevitably introduced the particle conception in the Anaxagorean system. This is to be seen, for instance, in *De caelo* 302 b 1, where the word ἠθροισμένον clearly suggests the particle conception. As a consequence, great difficulties arose in explaining Anaxagoras' theory of matter. After Aristotle the infinite regress has always harassed the theory.[74] In Antiquity the Aristotelic criticism was generally accepted and Anaxagoras' doctrine was regarded as absurd. In modern times, however, most interpreters have recognized that infinite divisibility is inseparable from Anaxagoras' theory. Nevertheless, most commentators have found it problematic. One of these is Cornford (1930) who (p. 14) puts the problem neatly in the following way:

"The theory rests on two propositions which seem flatly to contradict one another. One is the principle of Homoeomereity: A natural substance such as a piece of gold consists solely of parts which are like the whole and like one another – every one of them gold and nothing else. The other is 'There is a portion of everything in everything', understood to mean that a piece of gold (or any other substance), so far from containing nothing but gold, contains portions of every other substance in the world."

Cornford concludes that "unless Anaxagoras was extremely muddle-headed, he cannot have propounded a theory which simply *consists* of this contradiction" (italics original), i.e., he finds the theory extremely problematic, although he acknowledges (pp. 15–16) the principle of infinite divisibility as truly Anaxagorean. We shall see how he treats the problem. He takes (p. 15) the fragment B 10 as a starting-point. This fragment seems to Cornford (and others) to be evidence of the "Principle of Homoeomereity" as he calls it. In support he adduces Lucretius (DK 59 A 44) whom he interprets as showing that the principle of homoeomereity (p. 16) "asserts the existence of a class of substances (called ὁμοιομερῆ) such that, however far they are subdivided, the pieces will always be like one another and like the whole of which they are parts. The subdivisions of a piece of flesh or a piece of gold will always be flesh or gold." And in discussing (p. 18) the fragment B 10, Cornford entirely rejects the Anaxagorean principle of πάντα ἐν πᾶσι: "...there is nothing in this testimony to show that the

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[74] Cf. Simpl. *In Phys.* 460, 8 καὶ δείκνυσιν (ὁ Ἀριστοτέλης) ὅτι οὐ μόνον τὸ ὅλον μῖγμα ἄπειρον ἀνάγκη τῷ μεγέθει λέγειν αὐτόν, ἀλλα καὶ ἑκάστην ὁμοιομέρειαν ὁμοίως τῷ ὅλῳ πάντα ἔχουσαν ἐνυπάρχοντα, καὶ οὐδὲ ἄπειρα μόνον ἀλλὰ καὶ ἀπειράκις ἄπειρα.

germ must contain *any* other substances. That it should contain *all* other substances (a 'portion of everything' in that sense) is grotesquely superfluous and uneconomical. Why assert that an acorn contains gold and copper and emerald? ...It follows, of course, that the germ itself is not homoeomerous; part of it is (say) flesh, part bone, and so on" (italics original).

In Cornford's interpretation, then, not only the special thesis of πάντα ἐν πᾶσι is eliminated, but also the generic and fundamental Anaxagorean principle of ὁμοῦ πάντα. Obviously, the "principle of homoeomereity" led him on to that conclusion, although he accepted the infinite divisibility. Cornford's interpretation demonstrates clearly the very problematic nature of the traditional concept of "homoeomereity" in the doctrine of Anaxagoras.

TANNERY

The first interpreter to try to solve the difficulty in a new and radical way was Tannery (first ed. 1887). He discarded Aristotle's ὁμοιομερῆ[75] and emphasized (1930[2]: 296) that "Anaxagore ne parle que de qualités, l'humide, le sec, le chaud, le froid, le lumineux, l'obscur, le dense, le ténu, et il énonce formellement (fr. 8) que c'est par la concentration de ces qualités que se produit, d'une part, la Terre, de l'autre, l'éther." Tannery was followed by Burnet (first ed. 1892) who found his interpretation "substantially right" (1945[4]: 263, n. 1).

This position is well evidenced by the fragments; Anaxagoras repeatedly[76] speaks of qualities. With one exception, he always speaks of these as opposites, as general in Pre-Socratic philosophy. Other qualities, however, are mentioned once, in connection with the σπέρματα.[77] These specific qualities of the σπέρματα are neglected by Tannery as well as by Burnet. For both of them the σπέρματα seem to cause considerable concern. Tannery states that it is the opposites that are the things that are mixed with one another and structured is such a

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[75] P. 297 "...dire avec Aristote que le feu est constitué de particules *homéomères*, semblables à celles de la chair ou des os, c'est évidemment défigurer du tout au tout la pensée du Clazoménien".

[76] B 4, B 8, B 12, B 15.

[77] B 4 begin. καὶ σπέρματα πάντων χρημάτων καὶ ἰδέας παντοίας ἔχοντα καὶ χροιὰς καὶ ἡδονάς.

way that certain qualities are prevalent in certain points,[78] and then he discusses (pp. 296–297) "des semences (σπέρματα) en nombre indéfini dont aucune ne ressemble à aucune autre (fr. 4). Il est clair que ces *semences* devaient lui servir, par leur réunion, à former des êtres présentant les qualités prédominantes dans leur ensemble, et c'est de là sans doute qu'Aristote a tiré ses explications."

Here Tannery touches upon the particle conception, i.e., he tends to look upon the σπέρματα as discrete units,[79] and this conflicts with the infinite divisibility. Tannery is unable to explain the term σπέρμα.[80] In his attempts he cannot conceal the dilemma and ends by saying that the natural bodies are not elemental but arise through composition of the qualities which are the only Anaxagorean elements, according to Tannery.

This model is valid only as a criticism of Aristotle's representation of Anaxagoras' theory, but not as an interpretation of it, for Anaxagoras says explicitly (B 4 end) that the σπέρματα were part of the primordial σύμμιξις πάντων χρημάτων.[81] They cannot be "decomposables" into elements but must themselves be elemental.

Another problematic question concerns the nature of the qualities: Did Anaxagoras think of these as material substances, as other Pre-Socratics did, or did he conceive them as abstract entities? Tannery (pp. 297–298) is not able to decide upon either of the alternatives but suggests (p. 298) that Anaxagoras "a fait le premier pas indispensable pour l'abstraction". But the question should be answered. For, if they are abstractions, what is substantial in Anaxagoras' theory? And if they are substantial, the "semences" constituted of these must be secondary, i.e. non-elemental entities. They must be said to γίγνεσθαι, which is against Anaxagoras' own words (B 17).

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[78] Cf. p. 295: "A chaque point de la matière se trouvera donc attaché un coefficient pour chaque qualité considérée". See B 12 end.

[79] Cf. also p. 297: "...les *germes* ou *semences* se déplacent e se réunissent à leurs similaires, en sorte que le monde s'organise."

[80] "Pourquoi cette différence entre les *semences*? C'est que précisément elles présentent, de même que les corps de la nature, toutes les variations possibles entre leurs qualités. Mais sont-elles des éléments? Non pas: elles sont décomposables au même titre que tous les corps et présentent comme eux, à divers degrés, la même union du froid et du chaud, de l'humide et du sec...".

[81] The σπέρματα are stated as parallel with the qualities (opposites) and πολλὴ γῆ. In B 1 ἀήρ and αἰθήρ are also stated as ingredients of the primordial stage.

BURNET

Burnet (1945[4]: 263–264) maintains that the opposites, and not the different kinds of matter, the ὁμοιομερῆ, are that of which everything contains a portion. He does not say whether he regards them as substantial or abstract. That which contains a portion of every opposite is, according to Burnet, the "seeds" of each form of matter. And he continues (p. 264): "If we are to use the word 'element' at all, it is these seeds that are the elements in the system of Anaxagoras. Aristotle expresses this by saying that Anaxagoras regards the ὁμοιομερῆ as στοιχεῖα."

By this reasoning Burnet presupposes that Aristotle was right in identifying the Anaxagorean σπέρματα with his own ὁμοιομερῆ. But, granted that he was actually right in doing so, why does Burnet eliminate the opposites as candidates for an elemental status, when he has himself just noted (p. 263) that Arist. *Phys.* 187 a 25 "implies that the opposites of Anaxagoras had as much right to be called first principles as the 'homoeomeries'?"

Burnet does not state explicitly why he takes this position – contrary to Tannery – but apparently he regards the combinations of opposites in certain proportions, different for different substances, as fixed. A substance is thus permanent, elemental, and cannot be modified or changed through reduction or modification of certain ingredient opposites. This interpretation seems to run counter to the evidence of B 16 and B 17, where Anaxagoras discusses ἀπόκρισις and σύμμιξις, and B 12 begin., where he makes clear that these processes concern the opposites; their concentration in various parts of the world varies continuously through never ceasing processes which are caused by the permanent περιχώρησις.

Furthermore, Burnet (p. 264) inevitably gets into the problem of the particle conception, although he knows that in Anaxagoras' system matter is infinitely divisible. The "seeds" tend to be discrete particles of unchangeable, elemental substances. But such an interpretation is inconsistent. If matter is infinitely divisible there cannot exist such units.

Tannery and Burnet were not successful, then, in eliminating the concept of homoeomereity from Anaxagoras' system. Tannery could not solve the problem of substance in his model, and Burnet seems actually to commit a circular reasoning when he first rejects the natural substances and then asserts that just these, the ὁμοιομερῆ, and only

these, are the elements of Anaxagoras.

Thus it appears that the elimination of the ὁμοιομερῆ from the interpretation is not enough to solve the problems. Either the old difficulties remain or new ones arise. Tannery's view was already censured by Zeller [1891[5]],[82] and many scholars have followed him, while others have found the quality model of Tannery and Burnet preferable to the traditional Aristotelic ὁμοιομερῆ interpretation.

CAPELLE

Capelle (1919) is a representative of the traditional approach and he does not only reject the position of Tannery and Burnet as unacceptable (pp. 172–173), but also considers Anaxagoras to be quite incapable as a thinker. Assuming (p. 173) that Aristotle, who had Anaxagoras' book, correctly understood his theory of matter, Capelle is led to conclude that the Clazomenian did not hesitate to present a theory containing incompatible principles. Capelle's view (p. 174) is that the principle of everything in everything cannot be combined with the homoeomereity principle but that Anaxagoras nevertheless did combine them and thus was compelled to posit elemental pure particles (Urteilchen) of every substance.[83] Capelle ends his reasoning, then, in

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[82] Zeller 1920[6]: 1209, n. 2 "Und an die Stelle dieser Stoffe mit Tannery *Science Hell.* 286 f. 'Qualitäten' zu setzen, durch deren Verbindung die einzelnen Stoffe entstehen, widerstreitet nicht bloss allen unseren Zeugen ohne Ausnahme, sondern es findet auch in den eigenen Äusserungen des Philosophen keine Stütze ... Davon nicht zu reden, dass die Annahme für sich bestehender Qualitäten in jener Zeit eines unbefangenen Materialismus ohne Analogie wäre."

[83] "Das freilich lässt sich nicht verkennen, dass die Ansicht des Anaxagoras, dass alles in allem enthalten sei, ihre Schwierigkeiten hat, Schwierigkeiten, die darum nicht geringer werden, dass sie offenbar ihrem Autor noch nicht zum Bewusstsein gekommen sind. Wir können uns wohl die Dinge bis ins Unendliche geteilt vorstellen; eine Mischung der Stoffe bis ins Unendliche aber nicht. Denn das scheitert an den Grenzen unserer Vorstellungsfähigkeit. Wenn wir uns auch hundertmal vornehmen, die immer aufs neue zerlegten Teilchen der Materie als aus allen Stoffen gemischt vorzustellen, so müssen wir uns doch, wenn wir die Dinge nach dem in ihnen überwiegenden Stoff (Stein, Holz, Eisen usw.) unterscheiden und benennen, das betreffende Stück Materie in seinen Urteilchen einstoffig denken ... Dass dies Anaxagoras selbst getan hat, müssten wir a priori annehmen, da auch das Vorstellungsvermögen des Klazomeniers den Grenzen der menschlichen Vernuft unterworfen ist...

So bleibt eine Schwierigkeit in der Lehre des Anaxagoras bestehen. Die Mischung aller Stoffe bis ins Unendliche hat ihre Schranke an den Grenzen der menschlichen Vorstellungsfähigkeit. Und so gerät der Denker, ihm selbst unbewusst, unwillkürlich mit

the same position as Aristotle did, namely in cancelling the infinity conception which is, however, an indisputable principle in Anaxagoras' system.

Capelle's particle interpretation leads him to maintain (p. 176) that Anaxagoras "nur hätte schliessen dürfen, dass Vieles in Vielem, nicht aber, dass Alles in Allem enthalten sei". This line of thought occurs repeatedly in later commentators. We have already seen it above in Cornford's interpretation.[84] Although the principles of infinity and infinite divisibility obviously cannot be combined with a conception of particles, most commentators, apparently induced by the ancient doxographic tradition, conceive of Anaxagoras' theory of matter as a particle or molecule theory. It is when the particle conception is to be brought to harmonize with the Anaxagorean principle of πάντα ἐν πᾶσι that great difficulties arise. Hence the need for limitations or modifications of this principle presents itself. The attempts to conciliate the two are numerous and varied. We shall examine some interesting proposals and begin with that presented by Cornford.

CORNFORD

To Cornford (1930: 83) "it seems certain that the things which *contain* a portion of everything must be the Seeds; for larger things – the objects we see around us – are aggregates of various Seeds" (italics original). Then he asks: "But what are the things, of all of which a portion is contained in every Seed?" And Cornford posits that we have to choose between two alternatives: either (1) "these things are the Seeds (ὁμοιομέρειαι) themselves," so that "there is a portion (Seed) of every natural substance in every Seed;"[85] or (2) "the things are the Opposites," so that "there is a portion of every Opposite in every Seed."[86]

Cornford asserts (l.c., p. 23) that "the Seeds of all natural homoeomerous substances – and nothing else" are Anaxagoras' elements.[87]

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einer seiner eigenen Lehren in Widerspruch, weil er selbst gar nicht anders als anschaulich zu denken vermag: auch Anaxagoras nimmt Urteilchen an, die nur aus einem einzigen Stoffe bestehen, 'Samen', aus denen die sichtbare Welt aufgebaut ist".

[84] See above, pp. 29–30.

[85] This is the traditional, ancient doxographic model.

[86] This is the model propounded by Tannery, cf. above, pp. 30–31.

[87] This is Burnet's (p. 264) view, and it is in conflict with Anaxagoras' own words (B 4 end); cf. above, p. 31, n. 81.

Considering that Cornford (like most others) interprets σπέρματα as "particles of every homoeomerous substance" (p. 18), the choice of the second alternative is natural: the factors constituting and determining the seeds are the opposites. According to Cornford there is no need for portions of all seeds to be in all seeds. He points out (p. 89) – quite rightly, indeed – that Aristotle apparently expresses his own surmise in *Phys.* 187 a 26 ἔοικε δὲ 'Αναξαγόρας ἄπειρα οὕτως οἰηθῆναι διὰ τὸ ὑπολαμβάνειν τὴν κοινὴν δόξαν τῶν φυσικῶν εἶναι ἀληθῆ, ὡς οὐ γιγνομένου οὐδενὸς ἐκ τοῦ μὴ ὄντος. And he thinks that Anaxagoras may not himself have stated this as his reason for introducing the principle of everything in everything into his system. Rather, Cornford concludes (p. 91) that "Anaxagoras had no motive for making the assertion as construed by Aristotle and those who followed him. It is not only grotesque, but gratuitous".

This dismissal of Aristotle's representation of Anaxagoras on this point as being his own invention seems somewhat rash. It is fairly probable that Anaxagoras meant just that, although he may have formulated it another way. If the consequences seem grotesque it may well be due to Aristotle's identification of the Anaxagorean σπέρματα with his own ὁμοιομερῆ. But this identification is not called into question by Cornford.

Cornford (pp. 85–87) discusses the inseparability of the opposites. These he has stated (p. 84) to be substantial; he calls them "quality-things". According to Cornford, these constitute, all of them inseparably together but in different proportions, the natural substances (seeds, ὁμοιομερῆ). Having stated such a molecular structure of substance, Cornford puts the curious question (p. 87), "what the inseparable factors are – singular Opposites or Seeds". If natural substances are constituted of quality-substances, having no existence of their own, independently of the opposites, it is very difficult to see, (1) how they alone can be elements, and not the opposites, and (2) how natural substances can be separable (p. 87), as opposed to the opposites that constitute them. Anaxagoras teaches us (B 3, B 6) categorically that matter is infinitely divisible and that (B 6) ὅπωσπερ ἀρχὴν εἶναι καὶ νῦν πάντα ὁμοῦ. He says πάντα, and B 8 οὐ κεχώρισται ἀλλήλων τὰ ἐν τῷ ἑνὶ κόσμῳ is also clear evidence of the generality of these principles: nothing in this world is or can be separated from anything else. In his interpretation Cornford mutilates these fundamental principles of Anaxagoras' doctrine.

PECK

We will now examine the interpretation by Peck, who first presented it in 1926 and then completed and discussed it further in 1931. The interpretation shall be treated here especially because Peck tries in different ways to understand the term σπέρμα.

Peck considers the two Anaxagorean terms σπέρμα and μοῖρα to be synonyms. This identification (1926: 58) is, unfortunately, not supported by any evidence in the fragments. The terms are never used by Anaxagoras in such a way that we can conclude that their meaning is identical. Peck (l.c.) quotes the relevant passages of the fragments, among which B 4 is essential because σπέρμα occurs only there (twice). However, the word μοῖρα does not occur in those passages. The σπέρματα are said (B 4 end) to be ἄπειρα πλῆθος, while the μοῖραι are only spoken of as πολλαί (B 12 end). In B 6 we read ἐν πᾶσι δὲ πολλὰ ἔνεστι, and the initial sentence of B 4 runs: τούτων δὲ οὕτως ἐχόντων, χρὴ δοκεῖν ἐνεῖναι πολλά τε καὶ παντοῖα ἐν πᾶσι τοῖς συγκρινομένοις καὶ σπέρματα πάντων χρημάτων καὶ ἰδέας παντοίας ἔχοντα καὶ χροιὰς καὶ ἡδονάς. The word πολλά seems to have the same meaning in both passages, namely πολλαὶ μοῖραι. This can be concluded from formulations such as ἐν παντὶ γὰρ παντὸς μοῖρα ἔνεστι (B 11 and B 12 begin.). In order to identify πολλά with σπέρματα at the beginning of B 4 Peck takes the καί before σπέρματα to be explicative and translates: "We must believe that all and sundry are in every thing that has 'come together' (=the popular 'come into being'), i.e. that there are in them Seeds of all things, having all sorts of shapes and colours and tastes." But the καί before σπέρματα cannot be shown to be explicative;[88] it most probably has its normal, copulative sense.

Another indication that μοῖρα and σπέρμα do not have the same meaning is found in B 4 end: the σπέρματα are stated as being all unlike one another, which is never said about the μοῖραι.

Now, granted that Peck's identification of the two terms is right, this does not help him to interpret Anaxagoras' theory. Peck (1926: 61–62) discusses what the seeds (parts) are. He is reasoning in terms of mind (νοῦς) and organic growth: the seeds are like animal or plant seeds, i.e. each of them develops automatically into the things they are bound to produce. "The word 'Seed' suggests a principle of organic growth

[88] Peck does not discuss the various meanings of καί.

rather than mere mechanical aggregation, just as the notion of Mind does" (p. 61).

The opposites are related by Peck to the seeds in the following way (p. 61): "But something else must be present before they can actually grow: for no seed grows until it gets nourishment. What is this nourishment which the Seeds get? I think it must clearly be the remaining constituent of the original mixture, viz. the 'Opposites'." Peck (p. 62) makes use of both terms, "seed" and "part", after having used only "seed" when discussing growth. The term "part" seems to come in rather artificially: "A μοῖρα is something that has to be fulfilled, to be developed; its nature is settled once for all, and cannot alter; yet it unfolds gradually."

Peck (p. 62) argues that Anaxagoras explained change in the following way: "The Parts of all things which are present in any piece of Bread were at the beginning in the original mixture; but they were scattered about; there was no order among them. Mind, however, which brought order into the mixture, and decreed all the combinations and dissolutions that ever have been and ever shall be (see fr. 12), decreed that this Seed or Part of Bread should develop and actually produce the Bread which it was capable of producing."

According to Peck, mind (νοῦς) thus governs all change and all development in the world by means of the seeds (or parts). These are said (p. 62) to "control", or "almost inform", the material of which they are the predominating part. Peck develops (p. 70) his interpretation further: "It seems, in fact, to be the power of the Mind *in* the organic things (fr. 14) that makes it possible for change to take place... If another Part gains control (that is, if the object seems to turn into another object), this too is in virtue of Mind, which (fr. 12) 'has knowledge about everything'."

This interpretation is ingenious, indeed, but is it coherent, and is it in accord with the evidence of the fragments?

First, the expressions "scattered about" and "combinations and dissolutions" which Peck uses when speaking of the "parts of all things" inevitably show that he conceives of the parts (or seeds) as particles, although he stresses (1931: 117) the Anaxagorean principle of infinite divisibility.

Second, this obvious particle conception, with "combinations" of parts whose "nature is settled once for all, and cannot alter", to make sense things, is in flagrant conflict with the initially presented conception of "seed" as an entity that is to grow and develop into a thing

through the nourishment of the opposites. Peck drops these, and when speaking of parts or seeds of fixed nature which aggregate to form things, this interpretation lacks any support by the fragments and conflicts with their evidence (B 4, B 8, B 12, B 15): the processes of ἀπόκρισις, διάκρισις, and σύγκρισις concern the opposites.

Peck unconsciously makes use of two models, (1) growth of seeds into things or natural substances by means of the opposites which are conceived of as a class of substances different from the seeds, and (2) an aggregation model – initially (1926: 61) expressly rejected by Peck himself – with unalterable particles of matter to build up the perceptible things.

Although these two models are not, of course, compatible, Peck (1931) tries to keep both of them. He stresses (p. 33) that both the natural substances and the opposites are elements in Anaxagoras' system:[89] Anaxagoras "accepts ... the substances called the Opposites, and gives them a place among his elements ... but he introduces as additional elements the substances found in animal and vegetable organisms."

Peck (1931: 114–116) questions whether the seeds are elements or not. He defines them as "pieces of matter of variable and indeterminable size". And he rightly points out that "it is not pieces, variable in size, of substances, but the substances themselves, which rightly bear the name of 'element'". Thus Peck concludes that "of course he did not say that the Seeds were elements".

In discussing texts where seeds are mentioned in connection with Anaxagoras' doctrine, i.e., the fragment B 4, and Arist. *De caelo* 302 a 28, and *De gen. et corr.* 314 a 29, Peck (1931: 114–115) supposes that there are three possible meanings of the word σπέρμα, (1) a tiny piece of an elemental substance, (2) a tiny piece of matter containing a piece of all the element substances, with one of these prevailing in it, or (3) a seed in the ordinary sense, viz. a seed of a plant or an animal. He obviously does not consider a fourth meaning, which is commonly held,[90] namely that the seeds are the natural substances, the ὁμοιομερῆ themselves, in their totality. He chooses the second alternative, thus alleging that they are not elements.

Firstly, this is contrary to the evidence of the passage in Arist. *De caelo* 302 a 28 where the word σπέρματα is synonymous with

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[89] This is in accordance with Arist. *Phys.* 187 a 25.

[90] For example, Gomperz [1895] 1922[4]: I 175; Bröcker 1943: 180; Strang 1963: 114.

ὁμοιομερῆ, which are called elements (στοιχεῖα).

Secondly, the context of the second instance of σπέρμα in Anaxagoras (B 4 end) shows that by this word he indicates something equally original and elemental as the opposites. This use of the word is tantamount to saying that the σπέρματα are elements (incidentally, Anaxagoras did not dispose of the Aristotelian term στοιχεῖον).

It is now time to consider more thoroughly the part played by the opposites in Anaxagoras' theory of matter. The fragments show that these, together with the σπέρματα πάντων χρημάτων and the old four[91] elements, are the things (χρήματα) that are explicitly stated as ingredients of the primordial stage. Unfortunately, Anaxagoras does not make clear how these three categories are related to each other. The relationship between the opposites and the seeds is crucial to the interpretation of Anaxagoras' theory of matter. The problem is how to conserve their elemental status when put in some connection with each other.

Gigon (1939: 28) expressed his doubts whether the opposites and the seeds can be harmonized at all: "Es ist sehr bezeichnend, wie die alte Lehre von den in der ἀρχή enthaltenen Gegensatzpaaren einfach neben der neuen Theorie der Samen steht, ohne dass eine Vereinheitlichung versucht wird." The history of doxography and interpretation of Anaxagoras' theory seems to confirm this view. The divergent conclusions of Tannery and Burnet,[92] for example, are illustrative.

Raven (1954: 131) notes that the opposites figure very prominently throughout the fragments, but thinks (p. 132) that "the very prominence of the opposites does strongly suggest that Anaxagoras did not regard them, even though they are ingredients in the same original mixture, as on an exactly equal footing with the various sorts of natural substances the μοῖραι of which are in the σπέρματα".[93] Raven (l.c.) goes as far as to suppose that they were "specifically included in the list of the ingredients of the original mixture in Fr. 4 only because they had played so large a part in earlier cosmogonies".

This is most probably an undervaluation of the role played by the opposites in Anaxagoras' system – as well as of his capacity as a thinker. He can certainly be supposed to have aimed at a synthesis of

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[91] Viz., if ὕδωρ should be included; see below, p. 43, n. 107.

[92] See above, pp. 30–31 and 32–33.

[93] Guthrie (1965: 286) assumes on the contrary that they are.

all existing contemporary knowledge,[94] just as Aristotle did later, but that was probably not reason enough for him to include the opposites in his theory. We should certainly presuppose that the philosopher assigned them an essential function in the system. The prominence of the opposites in the fragments is more likely to reflect their importance than to disguise a humble role in the system.

The most common view among interpreters is that the opposites are constituents of the natural substances, i.e., the ὁμοιομερῆ or seeds,[95] and this interpretation is also found in combination with the opinion that Anaxagoras meant just that and nothing more with his statement that ἐν παντὶ παντὸς μοῖρα ἔνεστι (B 11). Μοῖρα is thought of as a portion[96] of an opposite, and of nothing else, inseparably integrated with the μοῖραι of all other opposites, in different proportions, to form different types of seeds. These are mostly regarded as units, or molecules, which build up the natural substances. This is the model presented by, among others, Cornford (1930), Gershenson-Greenberg (1964), and Cleve (1965).[97] Some scholars consider these units to be fixed in formation, i.e., as regards the proportions of the constituent μοῖραι of opposites.[98]

There are many objections to this interpretation. First of all, there is no evidence in the fragments, nor in the testimonia, to show that the σπέρματα are composed of the opposites.[99] Second, if the relationship

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[94] There are several indications in the fragments that Anaxagoras actually tried to construe a comprehensive theory that took into consideration practically all philosophical achievements up to his time. For instance, he paid due attention to Parmenides' logic (B 1) and Pythagorean mathematical thought (B 3), he was anxious to include (at least three of) the Empedoclean elements (B 1, B 2, B 4 end), he was clearly influenced by Ionian philosophy in stressing (*passim*) the part played by the opposites in his system, and in B 16 he seems to have been inspired by Anaximenes.

[95] E.g., Tannery, Burnet, Rivaud, Cornford, Peck, Vlastos, Raven, Cleve, and others.

[96] The most commonly held view of what a μοῖρα is like it represented by Raven in Kirk-Raven (1957: 377) "An Anaxagorean μοῖρα is a 'portion' in the sense of a 'share' rather than of a 'piece' or a 'particle'."

[97] See Cleve's scheme p. 189.

[98] Cf. Bailey 1928: 546–551; Peck 1931: 117, n. 3; Gershenson-Greenberg 1964: 15 "Anaxagoras ... chose as elementary all the different tissues of living organisms"; (p. 12) "Anaxagoras' theory was thus basically a molecular theory of matter ... it pictured matter made up of stable particles having the same properties as matter in bulk"; (p. 19) "In Anaxagoras' theory, then, each of the basic molecules possessed a set of basic, discrete, absolute qualities."

[99] The statement by Reesor (1960: 1) that "there is no evidence regarding the composition of the seed in the ancient sources" is somewhat too general: B 4 provides at least some information about them.

between opposites and natural substances is described in this way, the problem arises whether one of these categories must not be classed as non-elemental. If the opposites have no existence of their own, if namely, as Cornford (1930: 93) says, "these quality-things can exist only in the Seeds, not as a prior order of independent substances or elements," what are they then? They could be qualities in the Aristotelian sense, but Cornford calls them "quality-things" and makes clear that he does not consider them abstract qualities belonging to things, as in Aristotle, but substances, as general in Pre-Socratic, especially Milesian, thought. Nevertheless, Cornford continues: "Like Aristotle's simple bodies,[100] the Seeds are composed of Opposites, but cannot be cut up into those Opposites. Anaxagoras was bound to take this view, because otherwise these Opposites would become the elements of his system, and homoeomeries would arise out of them."

The glaring contradiction in the equating of simple and composed bodies shows that Cornford is disregarding their plurality and their status of distinct, different substances, obviously because he considers inseparability to mean unchangeable, fixed composition. But an element is *per definitionem*[101] something simple and pure. Obviously, Cornford does not represent Anaxagoras' theory correctly. The Clazomenian certainly realized that when something is composed of a set of other things, then these things are primary in relation to the resultant composed thing. For it was exactly this model of description of nature that he wanted to eliminate.

Consequently, the natural substances (ὁμοιομερῆ or σπέρματα) cannot, on this proposition, be primary, elemental, substances, since they are not "simple bodies", (ἁπλᾶ σώματα), but σύνθετα. Cornford apparently thought it axiomatic that the natural substances should be Anaxagoras' elements and thus tried to save them at any cost. Like other commentators, he took that position under the influence of Aristotle who, having found that Anaxagoras did not regard the natural substances as composed of the four Empedoclean elements, concluded that the natural substances were the elements (στοιξεῖα) in Anaxagoras' theory.[102] In *De gen. et corr.* 314 a 28 he even calls them ἁπλᾶ. But he may have said that only by accident or perhaps ironically, for he certainly understood that Anaxagoras did not mean that the

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[100] These are the four Empedoclean elements.

[101] See *Metaph.* 1014 a 26.

[102] *De caelo* 302 a 31 (DK 59 A 43).

natural substances were ἁπλᾶ σώματα in his own sense. He must have been well aware of the implications of Anaxagoras' principle of πάντα ἐν πᾶσι: in his theory there is nothing that is not mixed.[103]

The entire history of the interpretation of Anaxagoras' theory of matter is a history of futile efforts to get hold of a phantom which haunts that theory, namely the elementality of the natural substances together with that of the opposites. Interpreters from Theophrastus down to our time have tried to save the ὁμοιομερῆ as Aristotle rendered them in Anaxagoras' system, while putting them in a tenable relationship to the opposites, but in vain. Some commentators have resigned and deemed that the problem did not exist as such for Anaxagoras himself.[104] This is certainly an important consideration, but the problematic implications of the theory are such that they ought to have presented themselves even to a Pre-Socratic philosopher. It is more probable that he delivered a tolerably coherent system and that we have not yet been able to understand him correctly. If the system is misunderstood on one or two points, this may well make a comprehensive interpretation impossible. And misunderstandings are certainly to be expected, considering that the preserved fragments are few and the tradition confused.

We find, in any case, that the attempts made by numerous interpreters[105] to confine the range of the principle of πάντα ἐν πᾶσι to concern only the opposites *in* the natural substances, fail. This was, after all, exactly what was to be expected, seeing that the evidence of the fragments clearly shows that this principle has quite a general validity. It was formulated by Anaxagoras repeatedly in such general terms that any limitation of its validity ought to be supported by contrary evidence. The alternation between πᾶς and πολύς is of course insignificant. Anaxagoras always uses πᾶς to state the things in which everything is represented,[106] and the expressions πάντα παντὸς μοῖραν μετέχει / ἐν παντὶ παντὸς μοῖρα ἔνεστι are unambiguous. By the πολλά and πολλαὶ μοῖραι in B 4, B 6, and B 12 Anaxagoras seems

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[103] See *Phys.* 187 a 26–187 b 7 and 203 a 19.

[104] Stokes 1965: 18 "Opposites and substances are thought of together, without being placed in any but the vaguest of relationships". (P. 16) "Anaxagoras himself may not have seen all the problems raised by his views. In particular I should like to suggest that one of the most fundamental problems to trouble the moderns, the relation between opposites and substances, may never have occurred to Anaxagoras".

[105] See above, footnote 95.

[106] B 4 twice (ἐν πᾶσι and ἐν τῷ σύμπαντι), B 6 twice, B 11, and B 12.

to indicate that the things which are represented in everything are finite in number. These are probably the opposites and the four Empedoclean elements.

There is no evidence to show that Anaxagoras did not mean quite literally that everything is in everything. It must be considered improbable that πᾶς should not mean exactly "everything" on both sides of the proposition.

The Empedoclean Elements in Anaxagoras' Theory

We shall consider here a problem related to that of the σπέρματα and the ὁμοιομερῆ, the status of the old (Empedoclean) elements in Anaxagoras' theory of matter. 'Αήρ and αἰθήρ (which is probably =πῦρ) are mentioned in B 1, B 2, and B 12 (αἰθήρ even in B 15), and γῆ is found in B 4 end.[107]

Arist. *De caelo* 302 a 28 (DK 59 A 43) interprets the physical theories of Empedocles and Anaxagoras as being exactly opposite to each other. This implies that the four Empedoclean elements are not elements in Anaxagoras' theory. Instead, they are composed of his elements, the ὁμοιομερῆ. *De gen. et corr.* 314 a 24 Aristotle expresses his view very clearly: 'Εναντίως δὲ φαίνονται λέγοντες οἱ περὶ 'Αναξαγόραν τοῖς περὶ 'Εμπεδοκλέα· ὁ μὲν γάρ φησι πῦρ καὶ ὕδωρ καὶ γῆν στοιχεῖα τέσσαρα καὶ ἁπλᾶ εἶναι μᾶλλον ἢ σάρκα καὶ ὀστοῦν καὶ τὰ τοιαῦτα τῶν ὁμοιομερῶν, οἱ δὲ ταῦτα μὲν ἁπλᾶ καὶ στοιχεῖα, γῆν δὲ καὶ πῦρ καὶ ὕδωρ καὶ ἀέρα σύνθετα· πανσπερμίαν γὰρ εἶναι τούτων.

Aristotle often uses the word πανσπερμία when speaking of the Atomistic theory: *De caelo* 303 a 11 ἄπειρα δὲ τὰ σχήματα, ἄπειρα καὶ τὰ ἁπλᾶ σώματά φασιν εἶναι. ποῖον δὲ καὶ τί ἑκάστου τὸ σχῆμα τῶν στοιχείων, οὐθὲν ἐπιδιώρισαν, ἀλλὰ μόνον τῷ πυρὶ τὴν σφαῖραν ἀπέδωκαν· ἀέρα δὲ καὶ ὕδωρ καὶ τἆλλα μεγέθει καὶ μικρότητι διεῖλον, ὡς οὖσαν αὐτῶν τὴν φύσιν οἷον πανσπερμίαν πάντων τῶν στοιχείων.

Another passage is *De anima* 404 a 1 ἀπείρων γὰρ ὄντων σχημάτων

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[107] The fourth Empedoclean element, ὕδωρ, is not mentioned as part of the primordial stage (the word occurs only in B 16) but should probably be included.

καὶ ἀτόμων..., ὧν τὴν μὲν πανσπερμίαν στοιχεῖα λέγει (sc. Δημόκριτος) τῆς ὅλης φύσεως (ὁμοίως δὲ καὶ Λεύκιππος), τούτων δὲ τὰ σφαιροειδῆ ψυχήν.

In an interesting comparison between Anaxagoras and Democritus in *Phys.* 203 a 19 the word is also used: ὅσοι δ' ἄπειρα ποιοῦσι τὰ στοιχεῖα, καθάπερ Ἀναξαγόρας καὶ Δημόκριτος, ὁ μὲν ἐκ τῶν ὁμοιομερῶν, ὁ δὲ ἐκ τῆς πανσπερμίας τῶν σχημάτων, τῇ ἁφῇ συνεχὲς τὸ ἄπειρον εἶναί φασιν· καὶ ὁ μὲν ὁτιοῦν τῶν μορίων εἶναι μῖγμα ὁμοίως τῷ παντὶ διὰ τὸ ὁρᾶν ὁτιοῦν ἐξ ὁτουοῦν γιγνόμενον.

The last passage shows how Aristotle looked upon Anaxagoras' σπέρματα: he conceived of them as particles of natural substances, comparable to the atoms of Leucippus and Democritus, but each being a compound containing all substances. These particles are thus different from the atoms, which of course are pure, unmixed elemental particles. Consequently, the word πανσπερμία has different meanings when used about the Atomistic theory and when applied to that of Anaxagoras.

Most commentators[108] have accepted Aristotle's statement in *De caelo* 303 a 16 that Anaxagoras regarded the Empedoclean elements as non-elemental entities, being aggregations of the ὁμοιομερῆ. However, this is in obvious conflict with Anaxagoras' own words. B 1 and B 2 show that ἀήρ and αἰθήρ (πῦρ) are among the χρήματα that were part of the primordial μεῖγμα, and in B 4 end the γῆ πολλή is equally elemental as the opposites and the σπέρματα are.[109] All three categories belonged to the primordial σύμμιξις πάντων χρημάτων.

Some interpreters, however, have found Aristotle's presentation unacceptable and have acknowledged the elemental status of the old elements in Anaxagoras' theory.[110] Others have tolerated the presence

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[108] Cf. Zeller 1920[6]: 1210–1211; Gomperz 1922[4]: 175; Burnet 1945[4]: 265–266; Rivaud 1906: 194; Cornford 1930: 23; Peck 1926: 66 and 70; 1931: 30–31; Raven 1954: 125 and 132–133; Mathewson 1958: 78 "it is not easy to see why Aristotle should have made the statement that he does, if it was not true, simply in order to make a pretty contrast with Empedocles."

[109] See Cherniss 1935: 401. Vlastos 1950: 33, n. 17, and Stokes 1965: 16 interpret the genitives γῆς πολλῆς ἐνεούσης καὶ σπερμάτων ἀπείρων πλῆθος οὐδεν ἐοικότων ἀλλήλοις as absolute genitives with a causal meaning, while Bargrave-Weaver (1959: 87) takes them as parallel to the preceding appositional genitives. In both alternatives γῆ is clearly stated as elemental.

[110] See references in the preceding note. Cf. also Vlastos, p. 53, n. 77 "What possible motive could have led Anaxagoras to discriminate against fire, air, water, and earth, which are the basic constituents of Ionian cosmology (including his own), denying them the title of Being which he assigned to every other substance?"

of ἀήρ and αἰθήρ, but have questioned the γῆς πολλῆς ἐνεούσης of B 4 end.[111] Zafiropulo (1948: 376) and Cleve (1965: 174, n. 1) flatly rejected this phrase as an interpolation, and Romano (1965: 42–43) would not only cancel γῆ but ἀήρ and αἰθήρ as well.

Vlastos (1950: 33, n. 17) propounds that earth is one variety of seed. He thinks that τῶν ἄλλων in B 4 end "must refer to σπερμάτων in the preceding sentence", and maintains that "the sense can only be 'neither did any of the seeds other than the earth resemble one another'". This is not a very plausible interpretation; τῶν ἄλλων more probably refers to sense things, as does ἕτερον δὲ οὐδέν ἐστιν ὅμοιον οὐδενί in B 12 end. If Anaxagoras had wanted to say that γῆ was one among the other σπέρματα, he would certainly have been able to express that simple fact in a less complicated way. Anaxagoras used a very simple and sober style. Furthermore, granted that γῆ is one of the seeds, we should expect some information about the other Empedoclean elements, whether they are seeds or not. But there is no such information.

Now, it is certainly rather to be expected that Anaxagoras, like many of his contemporaries, identified the four elements with opposite quality substances.[112] But there is no evidence whatever for this interpretation either. For the suggestion by Jöhrens (1939: 35) that γῆ πολλή stands for πυκνόν lacks support.

The σπέρματα

The next issue in Anaxagorean interpretation that should be examined is the role of the σπέρματα in the system. The prevailing opinion is, as we have already seen above, that the μοῖραι are infinitesimal portions of the opposites, while the σπέρματα are molecular units constituted of these, combined in different proportions. But the term "seed" is also widely used by commentators as a synonym for ὁμοιομερῆ or ὁμοιομέρειαι, natural substances. The two terms, σπέρματα and

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[111] Gigon 1936: 28 "Rätselhaft bleibt mir die ausdrückliche Erwähnung der Erde"; Zafiropulo (1948: 376–377) cancels γῆς πολλῆς ἐνεούσης as an interpolation; Jöhrens 1939: 6–8 and 35 "γῆ πολλή steht offenbar für das πυκνόν, das sonst immer mit erwähnt wird".

[112] The four Empedoclean "roots" πῦρ, ἀήρ, ὕδωρ, γῆ were widely identified with hot, cold, moist, dry, especially in medical theory.

ὁμοιομερῆ, are first used as synonyms by Arist. *De caelo* 302 b 1 (DK 59 A 43). Whatever the reason might have been for Aristotle to use the term ὁμοιομερῆ when discussing Anaxagoras' doctrine, his use of the term σπέρματα as a synonym of it is remarkable indeed. For this implies that Aristotle was forced to use it in the same double sense as ὁμοιομερῆ, namely (1) natural substance in total sense and, (2) part of a natural substance, seeing that parts of a homoeomeous substance are equal to the whole, and to each other.

Now, this use of the term σπέρματα is contrary to what Anaxagoras states about them in B 4 end: they are infinite in number and they are all unlike one another. If we are to follow Aristotle in taking the σπέρματα of Anaxagoras to be identical with his own ὁμοιομερῆ we are involved in a very difficult problem. If σπέρματα are taken in the totality sense, we get a world containing infinitely many natural substances, which is absurd. If, on the other hand, σπέρματα are taken in the sense of parts of homoeomerous substances, which is the more common view, their infinite variety of nature cannot be explained at all. Parts of a homoeomerous substance are by definition all alike.

Several commentators have made efforts to solve the problem. Raven (1954: 130–131) considers that "a σπέρμα is ... an aggregation of an already infinite number of μοῖραι. That is why the σπέρματα in the original mixture are described in Fr. 4 as 'in no way like each other': the proportions of μοῖραι in the infinitely numerous σπέρματα can and do themselves vary infinitely."

The problem remains: if such seeds, no two of which are alike, are combined to form a mass of a substance, which is the generally assumed model of development of the mixture into a perceptible world,[113] the result will obviously not be a ὁμοιομερές in the Aristotelian sense.

Cornford (1930: 22) adjusts Anaxagoras' statement so as to make it compatible with the conception of ὁμοιομερῆ and asserts that "this obviously cannot mean that no two individual Seeds are alike; it must mean that there is a large number of different *kinds* of Seeds – as many, in fact, as there are natural substances – and an infinite number of individuals of each kind" (italics original). As a support for this opinion Cornford cites the passage in Simpl. *In De caelo* 229, 32, but this is worthless, seeing that it lacks any support by the evidence of the fragments. It is a typical example of that sort of doxographic state-

[113] Among those who have this model is also Raven (Kirk-Raven 1957: 386–388).

ments that were produced in order to save the ὁμοιομερῆ in Anaxagoras' theory.

Many commentators seem to avoid the problem of the infinitely numerous and dissimilar σπέρματα in various ways. Zeller (1920[6]: 1214-1215) notices that it is not clear what Anaxagoras meant by his characterization of the σπέρματα, whether different classes of substances, or the sense things composed by these, or the individual particles of any class of substance, and supposes that he did not decide upon this himself.

Gomperz (1922[4]: 175) credits Anaxagoras with assuming an infinite number of natural substances: "So viele Verschiedenheiten uns die Sinne offenbaren ... und so viele Kombinationen von solchen sich jemals in der Einheit eines Stoffgebildes zusammenfinden, so unerschöpflich zahlreich müssen die Urstoffe sein." If we substitute "thing" for "substance" this description would be acceptable; this shall be discussed further in the last chapter. It seems improbable that Anaxagoras should not have been aware of the absurdity of such a doctrine of substance as is ascribed to him by Gomperz.

Giussani (1896: 147–149) takes the term σπέρματα to mean both natural substances and particles of these. Since (p. 147) "la omeomeria è ... la essenziale caratteristica degli σπέρματα," their parts must all be alike but the fact that this conflicts with Anaxagoras' words in B 4 is overlooked by Giussani.

In the testimonies it is often repeated that the perceptible masses of natural substances are built up through the aggregation of "like to like".[114] The matter that is aggregated according to this principle is always pieces of these substances, the ὁμοιομέρειαι. The wording is always the same. It is noticed that the term σπέρμα is never used in the passages where the aggregation process is described. The bits of substances are not called σπέρματα, which would have been natural, if

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[114] Simpl. *In Phys.* 27, 12 (DK 59 A 41) ἐκεῖνος ('Αναξαγόρας) γάρ φησιν ἐν τῇ διακρίσει τοῦ ἀπείρου τὰ συγγενῆ φέρεσθαι πρὸς ἄλληλα, καὶ ὅτι μὲν ἐν τῷ παντὶ χρυσὸς ἦν, γίνεσθαι χρυσόν, ὅτι δὲ γῆ, γῆν· ὁμοίως δὲ καὶ τῶν ἄλλων ἕκαστον, ὡς οὐ γινομένων ἀλλ' ἐνυπαρχόντων πρότερον. 177, 20 Ὁ 'Αναξαγόρας ... δῆλός ἐστι τὴν γένεσιν ἑκάστου τῶν συνθέτων κατὰ τὴν τῶν ὁμοίων σύνθεσιν ἐπιτελεῖσθαι βουλόμενος, διότι καὶ διαιρούμενα εἰς τὰ ὅμοια ἐώρα (σάρκα γὰρ εἰς σάρκας καὶ ὀστοῦν εἰς ὀστᾶ), δοκεῖ δὲ ἕκαστον εἰς ἐκεῖνα διαιρεῖσθαι, ἐξ ὧν σύγκειται ... 32 σαρκὸς γοῦν τὰ μὲν ὡς μέρη ὅμοια (σάρκες γάρ), τὰ δὲ στοιχειώδη οὐκέτι σάρκες ... Arist. *De gen. anim.* 723 a 10 'Αναξαγόρας μὲν γὰρ εὐλόγως φησὶ σάρκας ἐκ τῆς τροφῆς προσιέναι ταῖς σαρξίν. Cf. Plat. *Phaed.* 96 C–D. Lucr. I 835 ff. (DK 59 A 44) ossa videlicet e pauxillis atque minutis ossibus ... concrescere.

they actually were the Anaxagorean σπέρματα. Instead, they are called ὅμοια, an apposite epithet for bits of a homoeomerous substance.

Although there is no connection whatever between these bits and the σπέρματα mentioned in B 4, the mechanism of aggregation of "like to like" is generally considered part of Anaxagoras' theory of matter, together with the Aristotelic notion of ὁμοιομερῆ, which is also without support in the fragments. Commentators tend to disguise the conflicting evidence by various means: they neglect the difficulty or try to explain it away.[115]

BAILEY

A singular variant of the view that the seeds are composed of the opposites was presented by Bailey (1928). Speaking of the primordial stage he interprets (p. 546) the Anaxagorean (B 4) term σύμμιξις as meaning "a union closer than mere mechanichal juxtaposition, and more like our notion of chemical fusion, a union in which things are not merely placed side by side, but are, as it were, completely merged in a new substance." According to Bailey (p. 587) νοῦς then caused that "bits of the μεῖγμα are separated off (ἀποκρίνονται). These bits which are separated off are in fact the 'seeds of all things, having all kinds of forms and colours and savours (ἡδονάς)'."

Bailey (p. 548) then puts the question, how it may be possible that these seeds differ in quality, and answers that "they differ in form ... and in colour and savour and other qualities owing to the constitution of the original μεῖγμα. For just as it, though in all its parts it contained all things, yet was not entirely homogeneous, for in different parts different things prevailed, so it is with the bits broken off from it. A bit which comes from a part of the μεῖγμα in which 'the moist' prevails will become a 'seed' of water, if it come from where 'the hot' dominates a seed of 'fire', and so on not only with the opposites, but with all concrete substances, gold, bone, flesh, blood, bread, etc."

Finally, Bailey declares (p. 549) how he thinks Anaxagoras imagined the sense things to be constituted. A piece of bread "is made up of a very large number of minute 'seeds' or particles in juxtaposition, each of which contains 'all things' in fusion: these 'seeds' were in origin bits

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[115] Cf. Capelle (1919: 174) who depreciates Anaxagoras as a thinker; Cornford (1930: 28–29) and Peck (1931: 112–116) do not take up discussion on the problem.

of the μεῖγμα separated off (ἀποκρινόμενα) and separated apart (διακρινόμενα) in the whirl, they subsequently came together (προσκριθέντα) and formed a compound body (συγκρινόμενον)."

There are a number of points in this interpretation that are open to objection as being in conflict with the evidence of the Anaxagorean fragments. The supposition that Anaxagoras thought of the πάντα ὁμοῦ stage as something like a fusion may well be approved of because there is no evidence against it, while it can be inferred from the fragments that he actually did. But, posited such a fusion, Bailey ought not to speak of differences between parts of this one primordial substance; a chemical fusion is not different in different parts of it. Thus the bits "broken off" from such a fusion must all be absolutely alike. But Bailey is induced by Anaxagoras' description of the σπέρματα as being all dissimilar to modify his own model and allow for the "fusion" not to be entirely homogeneous.

Bailey's next step in his description is overtly in conflict with Anaxagoras' words in B 1, B 2, and B 4, where ἀήρ, αἰθήρ (=πῦρ), and γῆ are stated as original ingredients in the primordial σύμμιξις. Bailey (p. 548) makes these substances resultants of the separating off of "moist" or "hot" or otherwise qualified bits from the μεῖγμα.

But, according to Bailey, not only the opposites are factors constituting seeds. There are also "all concrete substances" which dominate different "tracts of the μεῖγμα" (p. 548) so that, when bits are broken off from such tracts, these will be seeds of gold, bone, flesh, etc. These "concrete substance" seeds appear to form a separate class of seeds different from the class determined by prevalence of certain opposites. At least, Bailey does not state how the two types of seeds are related.

We have seen that the prevailing opinion among commentators[116] is that the opposites alone are constituents of the natural substances, which implies that these appear to be non-primary, non-elemental. Bailey's interpretation seems at first sight to be more in accord with the evidence of the fragments on one point: both the opposites and the σπέρματα are elemental. But he accepts the traditional doxographic tradition and regards them as discrete particles. And these are aggregated by juxtaposition to form perceptible things. Bailey's model is thus entirely against Anaxagoras' own words: There are no discrete particles, let alone two different classes of them, and Anaxagoras says

[116] See above, p. 40, n. 95.

nowhere in the preserved fragments that the σπέρματα are separated and combined to form sense things. The processes of separation and combination are stated only for the opposites and – very important indeed – nothing can be totally separated from anything else.

Bailey's description of Anaxagoras' doctrine is an illustrative example of the range of difficulties that arise for the interpreter. Amongst the points of conflict with the fragments, that of the aggregation of the seeds in juxtaposition should be especially observed. Although it is the traditional view and approved by most commentators, it is without any support in Anaxagoras' texts: the σπέρματα are not participants of the processes of transportation of matter.

Through the identification of the Anaxagorean σπέρματα with the ὁμοιομερῆ, made by Arist. *De caelo* 302 b 1, this concept was given the most important position in the system. This status was never called in question until Tannery [1887] presented his new interpretation based on the qualities (opposites), and thus assigned a more humble position to the σπέρματα. But that made their role in the system even more problematic.[117]

ZAFIROPULO

In general, the part played by the σπέρματα tends to be less important the more the importance of the opposites is emphasized in the system. One representative of this class of interpretation in which the σπέρματα are assigned an insignificant role is that of Zafiropulo (1948). He declares (pp. 278–279) that "il faut nous décider ou *pour* nos textes et *contre* les homoéomères, ou *pour* les homoéomères et remanier nos textes" (italics original). This is because (p. 279) "la critique d'Aristote montre qu'il n'a pas compris la théorie d'Anaxagore ou, peut-être, qu'il n'a pas voulu laisser dans ses écrits un exposé complet et une analyse approfondie de la subtile construction d'une école rivale".

Zafiropulo (pp. 282–285) interprets the term χρήματα as denoting the opposites and calls them "substances-fluides élémentaires" or "flu-

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[117] Tannery (1930²: 296–297) is in a quandary about which is the exact function of the σπέρματα in the system and states negatively that they are not elements but does not say clearly what sort of thing they actually are. The context shows, however, that he regards them as temporarily formed molecules composed of the opposites.

ides-qualité", and maintains (p. 368) that it is the plural χρήματα that denotes substances,[118] while the singular means "sense thing".

The quality-substances are, according to Zafiropulo (pp. 286–287), composed of infinitely small constituents, which are called σπέρματα by Anaxagoras. Zafiropulo names them "points-qualité" and (p. 287) regards them as "porteurs d'une qualité et d'une seule". According to Zafiropulo (p. 288) Anaxagoras "insiste fortement (il le répète deux foix de suite) sur le fait que chacune des catégories de points-qualité est totalement différente", i.e. the σπέρματα are not all of them individually different, but only each class is different from all others.

When cosmogony begins, the σπέρματα are first separated from each other and then unified into greater units, μοῖραι (p. 288): "Par suite de l'attraction du semblable sur le semblable, ces points se réunissent selon leur qualité propre ... et 'ainsi naissent des μοῖραι en nombre immense'.[119] Ces μοῖραι sont donc de véritable 'morceaux de fluide' composés de points-qualité tous semblable entre eux et nous les dénommerons éléments-qualité."

Finally, the formation of sense things is effected through the fusion of all sorts of μοῖραι.[120]

It is rather easy to establish that this model is either contrary to, or beyond the evidence of, the Anaxagorean fragments. First, the word χρήματα, when used about the primordial stage (B 1, B 4), denotes not only the opposites but also two entities other than opposites, γῆ, and σπέρματα πάντων χρημάτων.[121]

Second, if a σπέρμα shall be a "point" of a quality-substance (oppo-

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[118] B 9 τῶν νῦν ἐόντων χρημάτων Zafiropulo (p. 371) considers a casual exception.

[119] This is Zafiropulo's translation of B 12 end μοῖραι δὲ πολλαὶ πολλῶν εἰσι (p. 390). Of course, εἰσί cannot be given the specialized meaning "are born".

[120] P. 289: "Les éléments-qualité (μοῖραι) se mélageaient entre eux ... pour donner naissance au sensible."

This scheme is also propounded by Tagliaferro (1953: 297): ... bisognava interpretare gli σπέρματα anassagorei come appunto gli atomi, assolutamente minimi, di ogni singola sostanza, i componenti insomma delle μοῖραι qualitativamente omogenee, a loro volta componenti delle cose, dei χρήματα, nei quali c'è appunto ogni tipo di μοῖρα qualificata."

[121] Zafiropulo (pp. 376–377) excludes καὶ γῆς πολλῆς ἐνεούσης from B 4 end, and because he takes χρήματα in B 1 to mean only opposites he gets into difficulties in the interpretation of the apposition ἄπειρα καὶ πλῆθος καὶ σμικρότητα, seeing that elsewhere they appear to be limited in number (B 4 ἐνεῖναι πολλά τε καὶ παντοῖα and B 12 end μοῖραι δὲ πολλαὶ πολλῶν εἰσι). Zafiropulo (pp. 353–354) is forced to understand σπερμάτων as a qualifier of πλῆθος and σμικρότητα.

site), then it will be a bit of just that one quality and cannot be characterized (B 4) as having ἰδέας παντοίας καὶ χροιὰς καὶ ἡδονάς. Zafiropulo says himself (p. 287) that the σπέρματα are "porteurs d'une qualité et d'une seule". Further, there is no evidence that the statement (B 4 end), that the σπέρματα are all unlike, should refer to classes of σπέρματα, i.e. to each opposite. Why should Anaxagoras express this truism so emphatically? Moreover, why should he interrupt the enumeration of opposites at the end of the sentence and adduce their parts instead?

Third, the description of the σπέρματα and the μοῖραι as being parts of one, pure substance cannot be correct. Nothing can be pure in Anaxagoras' system.[122]

Fourth, there is no evidence in the fragments for the three-stage cosmogonical development outlined by Zafiropulo. Nowhere is it stated that the σπέρματα were aggregated to form μοῖραι, and these are never said to be parcels of pure substances, and their aggregation into perceptible things is not mentioned either.

Finally, in Zafiropulo's interpretation, Anaxagoras' theory is virtually made a variant of Empedocles' system: the sense things do not exist originally as such in any form but come into being only through the fusion of the elemental substances. And this was just the cardinal point in Anaxagoras' philosophy: to explain how everything has existence, in the sense of Parmenides, and does not come into being or perish into non-existence.[123] If Anaxagoras' system actually was such as Zafiropulo describes it, Aristotle would inevitably have established that τὰ ἐναντία alone were the elements of Anaxagoras, and not τά τε ὁμοιομερῆ καὶ τἀναντία (*Phys.* 187 a 25) or τὰ ὁμοιομερῆ alone, as he declares elsewhere (*De caelo* 302 a 31).

Two further interpretations should be mentioned in which the σπέρματα are assigned an insignificant part, while the opposites are viewed as the most important factors in the system, namely those by Cleve and Vlastos.

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[122] B 6 οὐδὲ χωρὶς ἔστιν εἶναι, ἀλλὰ πάντα παντὸς μοῖραν μετέχει. B 8 οὐ κεχώρισται ἀλλήλων τὰ ἐν τῷ ἑνὶ κόσμῳ οὐδὲ ἀποκέκοπται πελέκει κτλ.

[123] B 17 οὐδὲν γὰρ χρῆμα γίνεται οὐδὲ ἀπόλλυται, ἀλλ' ἀπὸ ἐόντων χρημάτων συμμίσγεταί τε καὶ διακρίνεται κτλ. B 10 πῶς γὰρ ἂν ἐκ μὴ τριχὸς γένοιτο θρὶξ καὶ σὰρξ ἐκ μὴ σαρκός.

CLEVE

Cleve's interpretation of Anaxagoras' philosophy was published in its first form as early as 1917.[124] His position is rather near to that of Tannery. He stresses the importance of the opposites and takes (1965: 173–174) σπέρματα to be (a) particles of these and (b) identical with the μοῖραι. As evidence for this interpretation Cleve adduces B 4 end, where he excludes καὶ γῆς πολλῆς ἐνεούσης as being an interpolation. Furthermore, Cleve alleges that σπερμάτων κτλ. is somehow explicative or specifying the preceding adjectives. It need not be discussed that this is a hardly probable, not to say impossible, meaning of the phrase.

Another dubious interpretation of the text follows on p. 175 where B 15 is taken to show that Anaxagoras regarded αἰθήρ as "a mixture of the rare and the warm and the bright". Cleve considers B 15 to be evidence that σπέρματα denotes particles of opposites, comparing Arist. *De caelo* 302 b 1 ἀέρα δὲ καὶ πῦρ μείγματα τούτων καὶ τῶν ἄλλων σπερμάτων πάντων.

These passages shall, apparently, form the evidence foundation for Cleve's conclusion that the opposites are the only elements of Anaxagoras. Of course, they are not sufficient. We shall see, however, what the implications of Cleve's position are and whether they support or detract further from its probability.

Considering that Cleve's interpretation is rather similar to Zafiropulo's, the critical points will be partially the same. Thus we find that Cleve is forced to conclude (p. 179) (1) that the elements, i.e. the opposites, are limited in number,[125] and (2) that the mutual dissimilarity of the σπέρματα refers to classes of σπέρματα, i.e. the opposites.[126]

Cleve (pp. 185–187) discusses at some length the passage B 4 begin. καὶ σπέρματα πάντων χρημάτων καὶ ἰδέας παντοίας ἔχοντα καὶ χροιὰς καὶ ἡδονάς. He supposes that the words ἰδέα, χροιή, ἡδονή have their original meaning: form/shape, surface, and pleasant sensation. Speaking of the crucial word ἔχοντα, Cleve begins by emphasizing its importance. However, he asserts (p. 187) that the σπέρματα (=μοῖραι) "*do not have* those qualities; they themselves *are* those qualities" (italics original). But then Cleve ends by saying, alas, that

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[124] *Die Philosophie des Anaxagoras. Versuch einer Rekonstruktion,* Wien 1917.

[125] Cf. Zafiropulo 1948: 289; 354; 378.

[126] Cf. above, pp. 51–52.

"*all these* (qualities) *are not Anaxagorean elements;* there are no seeds, no *moiras* of them. But *the seeds of the elements have them.* The *moiras,* the seeds *have* all those variable inherencies and potentialities" (italics original).

The glaring self-contradiction is certainly an indication of the difficulty, or better, impossibility of finding a solution to this passage on the premises given. Why should the parts of each opposite, say concretely "the bright", have, or perhaps be(!), say, a certain type of surface?

Like most other commentators Cleve ascribes a molecular conception to Anaxagoras. Μοῖραι (=σπέρματα) of the opposites aggregate to form molecules which in turn go together into natural substances. This model is similar to that of Zafiropulo, among others, which was commented upon above, pp. 50–52.

Cleve also treats (pp. 188–189) the fact that Aristotle assigned the ὁμοιομερῆ as the elements of Anaxagoras, and he thinks that "Aristotle might have attributed to Anaxagoras elements different from those he actually assumed". Assuming a molecular conception in Anaxagoras, Cleve considers it possible that the terms ὁμοιομερής and ὁμοιομέρεια might not be inventions by Aristotle or later authors but have been used by Anaxagoras himself. He makes an outline of an aggregation terminology comprising six terms. Among these only two, μοῖρα and χρῆμα, are found in Anaxagoras' text. And the essential term, as it seems, in a molecular terminology, namely a term for "molecule", is lacking. To fill the gap Cleve proposes μέρεια, but later (p. 194) he asserts that it is "quite obvious that this term *to synkrinomenon,* 'the grown-together', 'the fused', is an outright designation for the Anaxagorean molecule". In fact there is, however, only the term μοῖρα that would suggest a particle conception or an aggregation model in Anaxagoras. But his use of the word is such that it probably does not mean simply "particle".[127]

The molecular scheme presented by Cleve (p. 189) goes beyond evidence. The theory of discrete molecules in Anaxagoras cannot be right. The aggregation model as a whole seems to conflict with the Anaxagorean principle of no total separation (B 6 and B 8). It should also be noticed that Cleve regards the μοῖραι (=σπέρματα) as "ultimate particles". Since they are thought of as made of one pure substance (opposite), they will be equivalent to Democritus' atoms. Moreover,

[127] Most commentators prefer to translate "portion"; cf. Raven in Kirk-Raven 1957.

the careless identification of μοῖρα with σπέρμα is unacceptable. Anaxagoras is not – and no other philosopher is – likely to make use of two terms so different and – as regards σπέρμα – specific, simply as synonyms.

We have seen that both Zafiropulo and Cleve have totally eliminated the natural substances as elements in Anaxagoras' theory. These are made secondary and the opposites are made the only elements. This interpretation is much like Tannery's and is obtained by the subordination of the σπέρματα under the concept of opposites.

VLASTOS

Vlastos (1950) presents an interpretation in which he initially assigns a very prominent position to the concept of σπέρμα in Anaxagoras. He points out (p. 33) that he was the first to use the term σπέρμα as a generic physical term, i.e., even in regard to inorganic matter, and he rightly maintains that the context shows that Anaxagoras actually used it in this wide sense and that its proper meaning was in the main kept: "A seed is a compound of all the essential constituents of the parent body from which it comes and of the new organism into which it will grow" (p. 34). Vlastos is most probably right in supposing (p. 36) that "when Anaxagoras through the concept of the *seed* generalizes this principle of germination from biology to cosmology, extending it to any process of generation whatever, he is seeking to convey a new idea for which none of the traditional terms offered a fitting vehicle".

On pp. 39–42 Vlastos outlines his interpretation of what are the σπέρματα in Anaxagoras system: in the primordial matrix there were the opposites, the four Empedoclean elements, and the seeds of all natural substances. "All these substances ... were there as seeds." The opposites are ingredients of the seeds, but not the only ingredients, as in the interpretations of Zafiropulo and Cleve, because "any bit of matter, whether in the created world or in the primordial mixture, contains not only all the powers, but also all the seeds" (p. 47).

According to Vlastos, (pp. 41 and 46) Anaxagoras innovated three principles for his theory of matter:

(1) the idea of the seed,
(2) the idea of the infinitely small, and
(3) the idea of the absolute homogeneity of a given thing with any of its parts, however small.

Vlastos only implicitly states a fourth principle, the principle of 'everything in everything'. The third principle is a corollary of this and of the second. Vlastos (p. 46) points out that "homoeomereia", similarity of parts, "would be the perfect term for this principle".

This is certainly correct but in the formulation of the third principle Vlastos should have said "homoeomereity" instead of homogeneity because, as Vlastos himself says (p. 41), "any two things, however small, may now be shown to be both alike, since they contain 'portions of everything', and unlike, if they contain these portions in unequal ratios".

To judge from his description of the concept of σπέρμα in Anaxagoras, it would seem that Vlastos means that they were in some way like biological seeds, but that is obviously not the case. Vlastos discusses (pp. 48–49) Lucretius' representation of Anaxagoras' theory and notes (p. 49) that "there is no mention of the concept of the 'seed', nor of the powers".[128] Nevertheless he thinks that "Lucretius' residual rendering of Anaxagoras is perfectly sound".

This thus implies that Vlastos meant nothing more with his enthusiastic presentation of Anaxagoras' new concept, the σπέρματα πάντων χρημάτων, than the traditional particles, the ὁμοιομέρεια, current in ancient doxography.

However, it seems that there is another inconsistency in Vlastos' article. He puts the question (pp. 50–51), inspired by Cornford, how the traditional view of Anaxagoras' principle of everything in everything may be possible, namely that there is a portion of every opposite and a seed of every natural substance in every seed. Vlastos argues (pp. 53–54) that it is possible for every seed to be in every seed.

Before showing this, however, Vlastos wonders why it should be necessary at all to mix seeds of, say, flesh to the set of powers (opposites) which alone produce (constitute) that substance. Vlastos considers it necessary (p. 52) to assume that "there is some simple quality, fleshiness, which flesh possesses in addition to all its other specifiable powers".

Then Vlastos (pp. 53–54) sets about to show that it is possible for every seed to be in every seed: "Any seed is made up of the various powers in its own proper ratio; and since *all* the seeds are made up of the same set of powers, though in different ratios, it would follow that any seed contains any other, simply through the fact that it contains

[128] Vlastos uses this word (δυνάμεις) for opposites.

their necessary ingredients in portions which, however small, would still suffice to produce any of these other seeds in correspondingly minute form" (italics original).

Vlastos clarifies his thesis: "Thus any seed, *x*, contains any other seed, *y* ... simply through the fact that any *x*-seed contains the powers which would produce *y*-seeds if sorted out of *x* in the ratio appropriate to *y*."

This is evidently correct. Take, for example, a seed of milk, having portions of the relevant opposites, e.g., wet and dry, in, say, the ratio 10:1 (and other opposites in other quantities). It would then be possible to sort out a set of opposites among which the wet and the dry were in, say, the ratio 1:5, which would, perhaps, constitute a seed of chalk.

Now the question is: what are we doing when we sort out a seed of chalk from the seed of milk? In the last part of Vlastos' explanation (p. 54 top) cited above, nothing other than "necessary ingredients" are mentioned. Vlastos seems to mean powers. If so, we are doing exactly the same this time: whether we say that we sort out a set of powers in the appropriate ratios constituting a seed, or we say that we sort out just that seed, is equivalent.

It is so because the formation of the seed can only be described in one way, in terms of powers, of opposites, the ingredients. If we want to say that there are other seeds within it, we will have to account for their formation in turn by stating their proper set of opposites. There is no other criteria of a seed than its ingredients. But this fact apparently did not present itself to Vlastos' mind. It seems that he unconciously drops the seed feature, which was exactly what he had set himself to explain.[129]

There is an important implication of Vlastos' interpretation: the concept of "seed" will lose its status of element. This is because, if sets of opposites can be taken out of a seed to form other seeds, and this procedure can be continued until the original seed is totally dissolved into other seeds,[130] elementality will be a privilege of the opposites

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[129] Vlastos was thus quite successful in keeping his promise (p. 53) that his answer to the problem would be "wholly free from the redundancy of the traditional view".

[130] That the dissolution can be continued until it reaches its end is evident; there is nothing to halt it. See Vlastos, p. 55 "Thus hair can arise out of flesh, since the ingredients of flesh are also the ingredients of hair, and will constitute hair if taken in the required proportion. Yet hair never arises 'out of not-hair'; it arises out of the ingredients of hair which are in flesh (as well as in every other substance) and need only be

only. Consequently, in Vlastos' interpretation, Anaxagoras' doctrine will be a mere variant of Empedocles' system. The natural substances, represented by the seeds, have become ephemeral secondary entities.

We find, then, that Vlastos' interpretation turns out to be equivalent to those of Zafiropulo, Cleve, and Tannery.

STRANG

Another interpretation designed to halt the infinite regress is that propounded by Strang (1963). He introduces a distinction between common substances (C-substances) and elemental substances (E-substances). The latter are pure while the former are mixtures of all E-substances. An E-substance cannot be isolated because (p. 102) "there is a portion (μοῖρα) of every E-substance in every piece of matter, but not an isolable portion; for however far you subdivide any piece of matter each subdivision will contain the same number of E-ingredients as the original. One must never speak of *pieces* or *bits* of E-substances, but only of *portions* (or proportions or percentages) of E-substances in pieces or bits of C-substances" (italics original).

Strang (pp. 104–105) then discusses how E-substances are combined in proper proportions to make various C-substances emerge. The process is a redistribution of E-substances. "Thus an emergent C-substance may be said to come to be either by the *concentration at* a place of its proper E-substance or by the *separation* of it *from* the surrounding matter" (p. 105; italics original). Strang gives (p. 104) some possible cases of these processes, among which is number (iii): "A minor E-ingredient of one or more C-substances may at some place become so concentrated as to predominate there: the corresponding C-substance thereby comes to be by concentration or combination".

At first sight this model appears rather plausible. But Stokes (1965:2) rightly objects that Strang's E-substances cannot be in Anaxagoras' system because there is no room for any unmixed substances.

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taken out of flesh in the proportion proper to hair."

Stokes (1965: 4) who comments on Vlastos' thesis does not see this consequence. He apparently thinks that the infinite divisibility would warrant the permanence of the original substance (flesh in Vlastos' example), although we always "withdraw opposites" from it "in correct proportions to form any second substance". But infinite divisibility is irrelevant to the issue. Indeed, Stokes implies this by saying (l.c.) that Vlastos halts the infinite regress – which is certainly true: he removed the traditional problem of the chinese boxes from the concept of seed.

This point alone is fatal to Strang's proposal. But there is another one: the problem of the role played by the opposites in his model.

Strang (p. 110) classes these as E-substances parallel with the "E-substances proper",[131] which seems to be plausible. The two classes of E-substances combine to form C-substances. Strang also discerns a third class, one of "all other things, whether opposites or not, which A. covers with the words ἰδέας παντοίας καὶ χροιὰς καὶ ἡδονάς (B 4 *ad init.*)". But he fails to assign to them a position or function in the system.

Like Vlastos, Strang (p. 111) maintains that there is a need for E-substances proper, besides the opposites, to make up a C-substance and adduces two reasons for this: (1) most substances are too complex in appearance to be exhaustively describable in terms of opposites, and (2) description both in terms of substances proper and opposites is needed to account for the fact that "a C-substance can remain what it is throughout considerable variation of its ingredient opposites".

Anaxagoras may well have thought approximately this way, but how he explained the formation of perceptible things, Strang does not succeed in stating. He does not put the opposites and the E-substances proper in a defined relationship to each other.

Now Strang also fails to fit the term σπέρμα into his interpretation model. He takes it (p. 114) to mean "substances proper" in their totality as contrasted with opposites. He thinks (p. 115) that "it matters little whether C- or E-substances are meant" and that the two instances of the term in B 4 may refer to each of them, the first one to the C-substances, because there the σπέρματα "are said to have various qualities".

STOKES

Strang's interpretation of σπέρματα as referring to natural substances as such and not to particles of these is objected to by Stokes (1965: 9–10) seeing that there is very meagre evidence for this meaning of the word in Greek. This is no strong objection because this meaning cannot be excluded even in Arist. *De caelo* 302 b 1 and so it is with other parallels. But much stronger is the point adduced by Stokes (p. 10) that "if the seeds are E-substances their mutual difference would

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[131] By "substances proper" Strang labels the natural substances, whether C- or E-substances, e.g., gold, flesh, etc.

seem hardly worth emphasizing, for without it they could not be distinct and elemental: and it is equally obvious that no two C-substances are alike". And Stokes rightly points out that the term will not serve its function to distinguish seeds from opposites, for both opposites and substances differ from each other.

Strang (p. 116) censured Raven's (1954: 130) notion of the seed as "the simplest unit into which μοῖραι tend naturally to congregate" as "pure fantasy" and maintains that "nothing of the sort is either implied in the text or required to make A's system intelligible".

Unfortunately, Strang has not succeeded either in making Anaxagoras' system intelligible and it seems that exactly something of the sort suggested by Raven is actually implied in the text.

Stokes (p. 15) now supposes, on wondering how Anaxagoras might have thought it possible for cosmogony to start at all in a virtually altogether homogeneous mixture, that "Anaxagoras probably 'solved' this problem by postulating 'seeds' or growth-points as centres for the congregation of other similar seeds. The seeds were probably not pure: seeds in early Greece were thought of normally as mixtures ... seeds are probably to be thought of as particles, too small to be seen, in which something predominates".

This is a very interesting scheme. Nevertheless is forms no answer to all questions. First, there is not yet any clear connection between the seeds and the opposites.[132] Second, it is still difficult to see how these particles, the seeds, should not be alike within each group, i.e., those belonging to one substance, and differ only between groups, which is not a very probable interpretation of B 4 end.

Finally there is still another objection to Stoke's proposal. If each seed belonging to one substance is a growth-point, how would it be possible that such growth-points, all of which have equal rights to govern the growth, should be aggregated to one (or some?) distinct member(s) of the group? Moreover, as regards the concept of growth, can it at all signify a process of simple agglomeration of seeds that are all capable of developing a substance out of themselves?

SCHWABE

Schwabe (1975) presents a further model on which the concept of σπέρμα also turns out to be problematic and superfluous.

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[132] This was quite clear to Stokes (l.c.): "Nevertheless, the philosopher did not fully integrate the notions of seeds and portions."

Schwabe first censures (pp. 1–6) those interpretations that make the opposites play a prominent or even dominating part in the system.[133] In particular he criticizes Cornford's "solution". But Raven (in Kirk–Raven 1957) and Guthrie (1965), who tried to adjust his mistakes and modify the interpretation model so that opposites and natural substances should stand "on an equal footing" with each other, are also condemned, quite rightly, since their efforts to solve the problem were not successful.

Especially the conception of the σπέρματα as being molecules constituted of opposites in fixed proportions is rejected by Schwabe (pp. 5–6). He is quite right in pointing out that the necessity of assuming such units already in the primordial mixture (Guthrie 1965: 300), albeit infinitesimally small, is not acceptable.

Schwabe notes (p. 6) that Anaxagoras taught "dass 'die Samen aller Dinge' auch im ursprünglichen ὁμοῦ πάντα schon gegeben sind (B 4, letzter Satz); aber eben deshalb können sie keine Moleküle sein, in denen die μοῖραι der Elemente schon verschieden verteilt sind. Denn Anaxagoras hat seine Urmischung als eine absolut gleichmässige Vermischung aller Stoffe hingestellt, in der sich erst nach dem Eingreifen des Nus jene Zusammenscharungen herausbilden, die Raven und Guthrie in die σπέρματα verlagern... Im ursprünglichen ὁμοῦ πάντα herrschte also völlige Gleichmässigkeit der Verteilung".

On the basis of this premise Schwabe concludes that the σπέρματα must be identical with the infinitesimal μοῖραι. He takes the first sentence of B 4 to be evidence that the σπέρματα are "Bestandteile komplexer Gebilde (ἐν τοῖς συγκρινομένοις), und zwar so, dass sie ihrerseits nicht mehr durch einen Partikelaufbau, sondern durch abstrakte Eigenschaften in ihrer Besonderheit definiert sind (καὶ ἰδέας παντοίας ἔχοντα καὶ χροιὰς καὶ ἡδονάς). Diese σπέρματα können nur die kvalitativ unterschiedenen μοῖραι sein."

The last assertion that the μοῖραι are different in quality lacks any support whatsoever in the fragments: in B 6 they are related to τὸ μέγα and τὸ σμικρόν, i.e., to quantity, and elsewhere Anaxagoras only mentions them without any qualifier, as μοῖρα παντός (B 11, B 12) or μοῖραι πολλῶν (B 12 end). This fact is thus enough to refute Schwabe's identification of σπέρμα and μοῖρα. Another is the fact that the two terms are never put in any, not even the slightest, relationship to

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[133] Among these Schwabe mentions Tannery, Burnet, Cornford, Cleve, and Vlastos.

each other by Anaxagoras.[134]

Finally, there is an objection that strikes all interpretations except those that take σπέρμα to mean 'natural substance' in its totality, namely the fact that Anaxagoras does not say anywhere in the fragments that σπέρματα are aggregated at all. Only the term μοῖραι suggests this for the entities so called.

There is, however, one interesting point in Schwabe's model that calls for comment. He considers (p. 7) Anaxagoras' statement in the first sentence of B 4, that the σπέρματα "have" a set of qualities, to be evidence that he regarded all qualities, i.e., even the so-called opposites, as abstract. The material substances in Anaxagoras' system are, according to Schwabe, only the ὁμοιομερῆ.[135] To bring the evidence of B 4 end to square with this scheme Schwabe (p. 8) takes the opposite adjectives there in a collective sense, i.e., as concerning groups of ὁμοιομερῆ qualified by certain opposites. For example, τὸ θερμόν would be the class of ὁμοιομερῆ defined by the quality "hot", etc.[136]

This proposal is very unorthodox. Only Tannery (1930^2: 298) suggested that the opposites in Anaxagoras' philosophy might not necessarily be true material substances. But he did not decide clearly upon the question.

It is obvious that this interpretation of the opposites as abstract qualities belonging to the natural substances is refuted by the fact that – as we have just seen above – the term σπέρμα cannot be assigned a meaning in Schwabe's model, which is in accord with the fragments.

Furthermore, Schwabe admits (p. 9) that he is not able to assign a place for the four Empedoclean elements in his model. This is an equally great flaw in his interpretation, considering that these are not unessential to Anaxagoras' theory. On the contrary, the are mentioned at the very beginning of his book, and he returns frequently (B 12, B 15, B 16) to these entities. Any interpretation of Anaxagoras must account for their function in the system.

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[134] Schwabe's efforts (p. 7) to explain Anaxagoras' alleged use of the two terms as expressions for two aspects, one mathematic-structural (μοῖρα), and one genetic-hylozoic (σπέρμα), are entirely improbable.

[135] Schwabe (p. 9) does not decide upon whether the Empedoclean elements are elements or composed by ὁμοιομερῆ in Anaxagoras.

[136] Cf. Cornford 1930: 84–85 and 87.

SCHOFIELD

A particular position as regards the interpretation of the σπέρματα is taken by Schofield (1980). He takes it that the term preserves its normal, biological meaning and rejects the common view that Anaxagoras used it in a new, technical sense, denoting an agglomerate or molecule of every kind of substance. Schofield points out (pp. 123–124) that the only two instances of the word preserved in the fragments (B 4) are "precious little evidence for its Anaxagorean meaning in any case; and we should surely need more or more decisive instances before we accepted that so bold a redefinition as [the technical interpretation of alternative] (1) requires is to be ascribed to Anaxagoras." And he stresses (p. 124) that "its context in Fragment 4a is firmly zoological and agricultural. The reference to seeds is immediately followed by an instruction from Anaxagoras to suppose that men and animals were compounded".

Schofield regards B 4 as a whole as concerning the genesis of animals and plants in the first place and refers to the mention of earth and seeds together which Anaxagoras makes at the end of the fragment: καὶ γῆς πολλῆς ἐνεούσης καὶ σπερμάτων ἀπείρων πλῆθος, and suggests (pp. 125–126) that this is evidence that Anaxagoras speaks here of biological seeds.

As support for his interpretation, Schofield (pp. 124–125) adduces testimonia which seem to exhibit this meaning of the Anaxagorean σπέρματα: Hippol. *Refut.* I 8, 12 (DK 59 A 42) ζῷα δὲ τὴν μὲν ἀρχὴν ἐν ὑγρῷ γενέσθαι, μετὰ ταῦτα δὲ ἐξ ἀλλήλων, and the similar passage in Diog. II 9 (A 1) as well as Theophr. *Hist. Plant.* III 1, 4 (A 117) 'Αναξαγόρας μὲν τὸν ἀέρα πάντων φάσκων ἔχειν σπέρματα καὶ ταῦτα συγκαταφερόμενα τῷ ὕδατι γεννᾶν τὰ φυτά, and Aet. II 8, 1 (A 67) τὰ ζῷα ἐκ τῆς γῆς ἐξαγαγεῖν. And Schofield concludes (p. 126): "But if Anaxagoras used σπέρμα in the ordinary way in these contexts, then it is also probable that he did so in Fragments 4a and 4b."

This appears at first sight to be plausible. However, B 4 cannot be shown to be exactly or exclusively about zoogony; on the contrary, the text is only partially about this theme. On the whole, the fragment is highly cosmological and abstract and general; only the description of the humans existing elsewhere than in our οἰκουμένη is concrete. Whatever the origin of the doxographic material ascribed to Anaxagoras may be, we should not directly conclude that the term σπέρμα is

used in the same sense in B 4. There is another testimony of interest for our theme, namely Arist. *De caelo* 302 b 2 where σπέρματα does not have the biological sense; the word is obviously used as a technical or, better, ontological term.

Schofield (p. 124) gives two reasons why Anaxagoras may have found it necessary to posit the existence of natural zoic and botanic seeds in the primordial mixture. First, that "plants and animals are much too complicated and individual in structure and composition" to be explained as having originated through combinations of opposites and, second, that "there is a known mechanism whereby plants and animals are produced, viz. the propagation of seeds".

The first reason is plausible, while the second is not; instead it forms a contrary argument. For we read in B 4 end that the σπέρματα are ἄπειρα πλῆθος, which – considering the ability of propagation – seems to be unnecessary, unless Anaxagoras meant that the number of zoic and botanic species is infinite. This is, however, improbable; the σπέρματα appear to represent individual entities, not species. Indeed, in discussing the infinite number of seeds, Schofield (p. 127) himself seems again to leave out of consideration the biological propagation and merely to think of the individuals: "I imagine his (=Anaxagoras') idea is that if you look at all the plants and animals sustained by the earth..., you will find none very similar to any other."

The obvious generality of formulation found in Anaxagoras' statements in B 4 about the σπέρματα appears as problematic if these are taken to be natural seeds. Schofield (p. 126) tries to circumscribe the extent of "all things" in B 4 begin., σπέρματα πάντων χρημάτων: "But one might just as naturally take 'seeds of all things' to mean 'seeds of whatever can grow from a seed' (i.e. trees, horses, men; but not gold or earth)."

If Anaxagoras used the word σπέρμα in a zoogonical sense to denote the original seeds of species, one might wonder, (1) why he did not expressly say σπέρματα πάντων ζῴων καὶ φυτῶν, (2) how he could state (B 4 end) that these are infinite in number, and (3) why he found it necessary to emphasize that they are all unlike one another.

ANOTHER INTERPRETATION

In the preceding chapter we have examined a representative sample of interpretations that claim to be comprehensive models of Anaxagoras' theory of matter. There is a considerable number of further theses on Anaxagoras[137] that could or need not be scrutinized here. Many essays deal with partial aspects of his doctrine and are thus less important, because any interpretation of a philosophical system that is to be taken seriously ought to deal with the system as a whole, in all its aspects.

We found by investigating the various proposals for an understanding of Anaxagoras' thought that none of them could stand the confrontation in all respects with Anaxagoras' own words in the fragments. But an acceptable interpretation must, of course, be reconcilable with these on every point. Only on one condition can this claim be yielded, namely if one does not acknowledge the authenticity of the citations of Anaxagoras made by Simplicius. In modern times[138] only Gershenson-Greenberg have taken this extreme position.

To give a coherent account of Anaxagoras' system is certainly not an easy task. The large variety of opinions about it found in the very numerous interpretations and the large differences among them suggest this difficulty. The fact that there does not yet exist a consensus of opinion about Anaxagoras' teachings is remarkable. We must thus admit that our sources are such that we can never obtain a full knowledge of Anaxagoras' doctrine. We have to be content with a certain, possibly rather modest, degree of probability. However, most commentators apparently imagine that it is actually possible to get hold of the exact meaning of Anaxagoras' philosophy. Many representa-

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[137] See the exhaustive list presented by Gershenson-Greenberg 1964: 379–445.

[138] In 1840 F. Breier wrote a study on Anaxagoras (reported by Gershenson-Greenberg, pp. 391–392) where he looked upon Aristotle as the outstanding source of Anaxagoras and only used the fragments as supplementary evidence.

tions of his system are too pretentious. It is certainly not possible to present a very detailed account of his system. Nevertheless, this is exactly what interpreters often do. Some representations go far beyond the evidence, besides being in conflict with it on some points.

The interpretations that we scrutinized above are the more important ones, seeing that they are the more typical of various positions taken in the discussions of the philosophy of the Clazomenian. It may be established that there is a general tendency to emphasize either the opposites or the so-called ὁμοιομερῆ, the natural substances. The entire debate can mainly be said to concern precisely the relationship between these two groups. And to make the problem even more delicate, we have to admit that the very concept of the ὁμοιομερῆ may or may not belong to his doctrine. Intimately connected with this concept is that of the σπέρματα. It appears that without a proper comprehension of what sort of thing these actually are, we will never be able to understand the other ingredients of the theory and, consequently, will fail to understand it in its entirety.

However ambiguous the Anaxagorean words may be, it is clearly possible to establish a number of fundamental principles. We found above[139] that all except one[140] of these can be stated on the analysis of the very first sentence (B 1) of his book, namely the principles of

1 *No Becoming*
2 *Plurality*
3 *Everything Together* or *Unity*
4 *Infinite Divisibility*
5 *Infinity*
6 *Predominance*

All these are thus explicitly evidenced by Anaxagoras' own words, while a further principle, that of *Homoeomereity,* is indirectly evidenced by the testimonia and, perhaps, implicitly by the fragments, being a corollary of principles (3) and (4).[141]

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[139] See above, pp. 23–24.

[140] Principle (6), evidenced by B 12 end.

[141] Peck (1926 and 1931) argued that the concept of homoeomereity is more general in Anaxagoras' doctrine than in Aristotle; in Peck's (1926: 65) definition it means "having parts similar to the parts of everything else". Peck (l.c.) suggests that the term ὁμοιομέρεια may or may not have been used by Anaxagoras himself but that it was in use before Aristotle, viz. in the generic sense stated by Peck, being exactly the appropriate term for

These six principles should, then, be indisputable. We have to take Anaxagoras own words seriously. He certainly held the opinions that he expressed so clearly in his book. Our problem is to understand what he meant by them.

Principle (1) of *No Becoming* should be considered first. This principle had been newly formulated by Parmenides when Anaxagoras began his career as a philosopher. In contrast to other thinkers of his times, Empedocles and the Atomists, he took this fundamental law very seriously: nothing can come into being from that which does not exist and, reversely, nothing that exists can go into non-existence.

According to Eleatic logic, as a consequence of this premise the void cannot exist. That Anaxagoras also held this opinion is testified by Arist. *De caelo* 309 a 19 and *Phys.* 213 a 22 (DK 59 A 68).

Since everything that exists is given *ab aeternitate,* the concept of element is not relevant to the theory of Anaxagoras, just as it is not to the πᾶν of Parmenides. There is only one kind of existence in Anaxagoras, just as in Parmenides.[142]

In spite of this fact, the concept of element has always been used, from Aristotle who spoke of στοιχεῖα in Anaxagoras' doctrine, down to modern times. Virtually every commentator seems to posit the relevance of this concept for Anaxagoras. Nobody has ever spoken of elements in discussing the doctrine of Parmenides, probably because

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the characterization of Anaxagoras' theory of matter.

Peck's suggestion might be right; there is nothing that would logically preclude that the term was coined for this purpose of denoting what was typical of Anaxagoras' doctrine, which was dominated by the principle of ὁμοῦ πάντα. It should be observed that a molecular conception of matter like that assumed for Anaxagoras by Peck (and similarly by Cleve 1965: 188–189) – which is obviously false – is no prerequisite for the use of the concept of homoeomereity in the description of his theory, namely if it is taken in this generic sense. For it seems probable that the ὁμοῦ πάντα denotes a fusion, not a juxtaposition of particles. See discussion below, pp. 74–76.

On the other hand, it is improbable that Aristotle should have used his term ὁμοιομερής in another sense, without stating this and without even mentioning Anaxagoras' term, if it were actually in use. And there is further evidence that Anaxagoras did not use it, namely its absence from the quotations made by Simplicius.

[142] Guthrie 1965: 292 "Ever since Aristotle expositors have taken it further by asking themselves the question: 'What for Anaxagoras are the elements or first principles (ἀρχαί or στοιχεῖα)'? ... But there is no evidence in the remains of Anaxagoras's own writings of any word for elements or principles... In what sense can one speak of elements in a ὁμοῦ, an 'all things together', which exists now as in the beginning? Aristotle at least was led into confusion by thinking that way."

this is indisputably a monistic doctrine. Anaxagoras is not so easy to classify. He was classed by Arist. *Phys.* 203 a 19 (DK 59 A 45) as an extreme pluralist together with Democritus.

This classification is by no means wrong; Anaxagoras should certainly be classed as a pluralist. According to principle (2) *Plurality* he evidently was.

Nevertheless, his doctrine also has a monistic character. This was likewise observed by Arist. *Phys.* 187 a 21: καὶ ὅσοι δ' ἓν καὶ πολλά φασιν εἶναι ὥσπερ Ἐμπεδοκλῆς καὶ Ἀναξαγόρας. And Theophrastus, cited by Simpl. *In Phys.* 154, 19, also suggests this interpretation of Anaxagoras' concept of matter and concludes, considering that he posited the concept of νοῦς besides matter, that Anaxagoras' theory was a dualistic one.[143] The monistic character of Anaxagoras doctrine of matter has not been duly observed.[144] Principle (3) *Everything Together/Unity* emphasizes the inseparability and unity of matter. Anaxagoras makes it quite clear what he meant with this principle: (B 6) οὐδὲ χωρὶς ἔστιν εἶναι, ἀλλὰ πάντα παντὸς μοῖραν μετέχει, and (B 8) οὐ κεχώρισται ἀλλήλων τὰ ἐν τῷ ἑνὶ κόσμῳ.

By these words Anaxagoras evidently rejects the notion of juxtaposition; everything is mixed with everything, not side by side but within. This is also suggested in B 4 ἡ σύμμιξις πάντων χρημάτων. In B 6 Anaxagoras states the reason why everything is mixed with everything: ὅτε τοὐλάχιστον μὴ ἔστιν εἶναι, οὐκ ἂν δύναιτο χωρισθῆναι, οὐδ' ἂν ἐφ' ἑαυτοῦ γενέσθαι, ἀλλ' ὅπωσπερ ἀρχὴν εἶναι καὶ νῦν πάντα ὁμοῦ.

By the principle (4) of *Infinite Divisibility,* Anaxagoras explains how everything can participate in everything else. Two concepts are absent from Anaxagoras' theory: (1) Particles of fixed size, and (2) juxtaposition. We shall discuss the implications of these facts further below.

Since everything participates in everything, nothing can be pure or separate (B 6, B 8). It is evident that Anaxagoras conceived of matter as one unit, although constituted of a plurality of factors, which are

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[143] Εἰ δέ τις τὴν μῖξιν τῶν ἁπάντων ὑπολάβοι μίαν εἶναι φύσιν ἀόριστον καὶ κατ' εἶδος καὶ κατὰ μέγεθος, ὅπερ ἂν δόξειε βούλεσθαι λέγειν, συμβαίνει δύο τὰς ἀρχὰς αὐτῷ λέγειν τήν τε τοῦ ἀπείρου φύσιν καὶ τὸν νοῦν, ὥστε πάντως φαίνεται τὰ σωματικὰ στοιχεῖα παραπλησίως ποιῶν Ἀναξιμάνδρῳ.

[144] Diels, *ad* B 1, noticed the parallel expressions, ὁμοῦ πάντα in Anaxagoras and ὁμοῦ πᾶν in Parmenides DK 28 B 8, 5. That Anaxagoras combines Parmenides' conception of a continuous being with pluralism is also stressed by Bloch 1959: 7 "Die absolute Einheit des Seins wird im Sinne des Parmenides festgehalten, seine gleichzeitige Geteiltheit erkannt und erläutert, das Nichts abgelehnt."

fused into one continuous mass.[145] Considering that Anaxagoras was probably anxious to meet the demands of Eleatic logic, it is probable that he thought of this mass as being an absolutely homogeneous ὄν. He does not state this expressly, however, but the idea seems to inhere in B 1, B 4, B 6 and B 8. This one being is then equivalent to Parmenides' ἕν. The only difference is the plurality of constituents in Anaxagoras' universal mass.

The conclusion is, then, that Anaxagoras should not be classed as either pluralist or monist, but as both. There are, of course, many – infinitely many – entities in his system, but although he looked at matter in this way, he evidently also had a monistic approach as well.

Now, according to principle (1) *No Becoming* nothing in his system can be classed as non-elemental. Any discussion regarding which the elements of Anaxagoras are is therefore meaningless and illogical. If we could demonstrate that there are things not elemental in his doctrine, this would mean that he had committed a contradiction against his own principle (1), which was probably the very starting-point for his philosophy of matter.

It will be appropriate here to consider the relationships between the philosophers of the generation after Parmenides. Or, more precisely, what was the position of Anaxagoras among them? Parmenides and other Eleatics had denied the reality of change. They assumed a static universe. Anaxagoras, as well as Empedocles and the Atomists, acknowledged that change must somehow be real. However, all of them felt themselves bound by Eleatic logic to maintain the law of permanence of matter: no substance can arise or perish. To account for change, however, they felt that Parmenides must be modified on some points.

Thus the Atomists assumed, against Parmenides, that the void (τὸ κενόν) exists as a term opposite to the full (τὸ πλῆρες), i.e. matter, and that most qualities do not belong to matter, the atoms, but to the sense things. By stating that all atoms are of the same nature, the Atomists preserved the oneness of being in a qualitative sense. Empedocles, on his part, dismissed the Parmenidean idea of unity of being, though without accepting the void, and assumed as elements six different and separable substances in juxtaposition, each having a set of

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[145] That Anaxagoras thought of the universal mixture virtually as a chemical fusion was suggested by Bailey (1928: 546), Guthrie (1965: 297), and Barnes (1979: 23).

qualities. In both these systems, the perceptible things with their qualities had no existence as such; they were phenomena.

Anaxagoras took a more rigorous position: everything in the universe must be assumed to have full, Parmenidean, being (principle (1) *No Becoming*). And this principle was combined with the second: *Plurality*. By the general initial phrase (B 1) ὁμοῦ πάντα χρήματα ἦν Anaxagoras tried to express this, and in B 4 he specified the "everything". He speaks of the σπέρματα, all of which have various qualities and are innumerous. He evidently thinks of these entities as elemental: in B 4 they are said to be part of the primordial mixture. Besides the σπέρματα, there are more elemental things in it: Anaxagoras also thought it necessary to count the four old elements as specific ingredients of the universe,[146] as well as the traditional opposites. Anything that is found to exist in the world must have been there as such in the primordial mixture. Nothing is primary in relation to anything else. But how is this possible? Given the principles (1) and (2) as premises, Anaxagoras was forced to posit that everything was inseparably mixed with everything else (principle (3)). He tried to express this by stating that anything comes out of anything: B 10, B 16, and Arist. *Phys.* 187 b 1.

But how, in turn, could this be possible? Anaxagoras answered this question in a very radical manner: matter is infinitely divisible. The principle (4) *Infinite Divisibility,* or the idea of the *Infinitely Small*, applied to matter is, as far as we know, unique to Anaxagoras and never held by anyone else in the history of ideas.

It was most probably Zeno of Elea who inspired Anaxagoras to assume this principle for his theory of matter. Raven (in Kirk–Raven 1957: 370–372) rightly suggests that in B 3 and B 5 Anaxagoras explicitly replies to him. The relative chronology among the thinkers after Parmenides is notoriously problematic. We do not know at exactly which time Zeno's famous book was published, but the information offered by Plat. *Parm.* 128 D suggests that he wrote it as quite a young man. Seeing that he was probably no more than 10–15 years younger than Anaxagoras (Raven, l.c. pp. 263–264; 286; 363) and that the latter seems to have published his work rather late (Arist. *Metaph.* 984 a 11), Zeno's book may well have been earlier than Anaxagoras'.

[146] See above, pp. 43–45. Water (ὕδωρ) is not expressly mentioned as part of the primordial mixture, but it is improbable that he should not have included it (cf. principle (1)). That αἰθήρ in B 1 means πῦρ, which is stated by Arist. *De caelo* 302 b 4, can hardly be doubted.

The internal relationship of thought discernable in the two philosophers indicates that this may actually have been the case.

This is also so with Empedocles; it is logically improbable that he should have presented his comparably gross system after Anaxagoras had published his sophisticated theory.[147] Arist. *Metaph.* 984 a 11 (DK 59 A 43) is no proof against this conclusion, which was also suggested above, p. 11.

For the Atomistic theory, the land lies somewhat differently. Because of the mysterious personage Leucippus, whose very existence has been in doubt since Epicurus (Diog. Laert. X 13), it is still more difficult to establish the date of origin of Atomism. However, we should probably not take Epicurus too seriously. Burnet (1945[4]: 330, n. 2) is probably right in supposing that the statement is "a characteristic Epicurean sally". And if we consider the fact that we are dealing with a person of the classical period, it appears very improbable that Leucippus should be pure fiction. This would be a case without parallel in such late times of Greek history. If, then, Leucippus has actually lived, then he was supposedly about 30 years older that Democritus, who was born about 460. This would mean that he was a contemporary of Zeno and Empedocles and, thus, may also have presented his theory, Atomism, before Anaxagoras published his theory.[148]

There are logical reasons to suppose that, by his theory, Anaxagoras opposed Atomism. His emphatically stated thesis (B 3 and B 6) that matter *is* infinitely divisible, and the principle (3) of *Everything Together* or *Unity,* repeated *ad nauseam* (B 4, B 6, B 8, B 11, B 12), will be best understood as a polemic against all three contemporaries and competitors of his,Empedocles, Leucippus, and Zeno.

After this excursus, we shall see how Anaxagoras opposed Zeno, who considered it absurd that matter should be many, because, on the principle of infinity, it would then be infinitely divisible into the infinitely small which would ultimately turn out to be non-being; and infinitely large; and the same thing would be said to be both large and small, which is absurd.[149]

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[147] O'Brien (1968) contends to the contrary that Anaxagoras wrote before Empedocles, but his arguments are undecisive.

[148] Brieger (1901) asserts that the Atomistic theory was propounded as a corrective to that of Anaxagoras, but his argumentation is based on depreciation and misinterpretation of his theory.

[149] Zeno, Fr. 1 (DK 29 B 1) εἰ μὴ ἔχοι μέγεθος τὸ ὄν, οὐδ' ἂν εἴη . . . οὕτως εἰ πολλά

Anaxagoras (B 3) frankly contradicts Zeno: matter *can* be divided *ad infinitum* and *can* be infinitely large:[150] οὔτε γὰρ τοῦ σμικροῦ ἐστι τό γε ἐλάχιστον, ἀλλ' ἔλασσον ἀεί (τὸ γὰρ ἐὸν οὐκ ἔστι τὸ μὴ οὐκ εἶναι),[151] ἀλλὰ καὶ τοῦ μεγάλου ἀεί ἐστι μεῖζον.

And a given thing *can* be both large and small, namely with respect to the number of its parts: καὶ ἴσον ἐστὶ τῷ σμικρῷ πλῆθος, πρὸς ἑαυτὸ δὲ ἕκαστόν ἐστι καὶ μέγα καὶ σμικρόν.

The idea is made clearer in B 6 ἴσαι μοῖραί εἰσι τοῦ τε μεγάλου καὶ τοῦ σμικροῦ πλῆθος.

Anaxagoras also argued against Zeno in B 5. Zeno (DK 29 B 3) had contended that, if things are many, they are both infinite and finite in number, because εἰ πολλά ἐστιν, ἀνάγκη τοσαῦτα εἶναι ὅσα ἔστι καὶ οὔτε πλείονα αὐτῶν οὔτε ἐλάττονα. εἰ δὲ τοσαῦτά ἐστιν ὅσα ἐστί, πεπερασμένα ἂν εἴη.

To Anaxagoras it was evident that just as a finite number so also an infinite is no more and no less than it is. He simply points out that this argument of Zeno's against plurality and infinite divisibility is worthless. By his reasoning in these questions, Anaxagoras clearly demonstrates his capacity of a thinker. Guthrie (1965: 289) rightly states that "Anaxagoras's reply (to Zeno) shows an understanding of the meaning of infinity which no Greek before him had attained". Thus (p. 290) "we can have no doubt by now of the subtlety and originality of Anaxagoras's thought".

The opinions about Anaxagoras' capacity as a philosopher diverge widely among his interpreters. On the one hand, he is considered a very original and epoch-making thinker, especially because he introduced the concept of νοῦς as a distinct causal and governing entity in his explication of the cosmos, but also with regard to his theory of

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ἐστιν, ἀνάγκη αὐτὰ μικρά τε εἶναι καὶ μεγάλα· μικρὰ μὲν ὥστε μὴ ἔχειν μέγεθος, μεγάλα δὲ ὥστε ἄπειρα εἶναι.

DK 29 B 3 εἰ πολλά ἐστιν, ἄπειρα τὰ ὄντα ἐστὶν· ἀεὶ γὰρ ἕτερα μεταξὺ τῶν ὄντων ἐστί, καὶ πάλιν ἐκείνων ἕτερα μεταξύ. καὶ οὕτως ἄπειρα τὰ ὄντα ἐστί.

[150] Cf. Raven in Kirk–Raven (1957: 370–372) and Muñoz Valle (1976: 107–109). Strang (1965: 107–108) tried in vain to argue against this obvious sense of the fragment.

[151] Zeller (1920[6]: 1219, n. 3) proposed to read τομῇ οὐκ εἶναι, which was approved by, among others, Burnet (1945[4]: 258, n. 2). Raven in Kirk-Raven (1957: 372), and Cleve (1965: 183, n. 2), while Guthrie (1965: 289, n. 2) wonders whether Anaxagoras would have considered οὐκ ἔστι οὐκ εἶναι to be tolerable Greek.

Although the emendation is not necessary, it certainly would make the phrase more clear and expressive. Perhaps Anaxagoras wrote οὐκ ἔστι τομῇ μὴ οὐκ εἶναι.

matter.[152] On the other hand, many commentators have taken a more or less negative position to the Clazomenian, just as was so common among the ancients.[153]

Judging from Anaxagoras' treatment of the problem of infinity as demonstrated in the first few fragments of his book, we are obliged to consider him entirely competent as a thinker. He shows that his capacity of abstract thought was entirely on a par with that of Parmenides or Heraclitus. Consequently, we should not be prone to the expectation of finding inconsistencies or lack of coherence between parts of his system. Two relationships have always been considered very problematic in Anaxagoras, between the opposites and the σπέρματα and between the traditional (Empedoclean) elements and the other ingredients of the system. Should we resign and suppose that Anaxagoras actually committed such grave flaws as putting distinct ingredients side by side without accounting logically for their interrelations? Probably not, at least not before we have tried every possibility of a solution.

Returning to our theme, the infinite divisibility, we have established that Anaxagoras assumed that this geometrical concept is also valid for the physical world, for matter, apparently considering that it belongs logically to the concept of infinity in general.

Commentators have found it very hard to believe that Anaxagoras actually meant what he said when he asserted that there is no minimal unit. This is because there are some indications in the fragments that he did not strictly adhere to this premise in the consequences. Thus there are hints which suggest a conception of discrete particles in Anaxagoras' own words. The terms μοῖρα and σπέρμα are the most significant.

As regards the obvious particle conception haunting Anaxagoras' theory in the testimonia, this tradition is certainly largely due to Aristotle's representation of it. Since the very concept of infinity was anathema to him, he discussed and criticized Anaxagoras' doctrine on his own presumption that there is a minimum.[154] It is not necessary to suppose that the conception of particles was intruded into the theory

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[152] E.g., Bröcker 1943, Ciurnelli 1947, Zafiropulo 1948, Vlastos 1950, Gershenson-Greenberg 1964, Cleve 1965, Carbonara Naddei 1969.

[153] E.g., Brieger 1901, Capelle 1919, Gomperz 1922[4].

[154] E.g., *Phys.* 187 b 37 φανερὸν ὅτι ἐκ τῆς ἐλαχίστης σαρκὸς οὐθὲν ἐκκριθήσεται σῶμα· ἔσται γὰρ ἐλάττων τῆς ἐλαχίστης.

by the Atomists, specifically the Epicureans, which was argued by Lanza (1963); it is already clearly demonstrable in Aristotle.[155]

In modern times interpreters unanimously acknowledge that Anaxagoras held the principle of infinitely divisible matter. But on the suggestions in Anaxagoras' text and the evidence of the testimonia practically all commentators have found it inevitable to talk about particles when analysing his theory. Mostly the particles are epithetized "infinitely small" or "infinitesimal", but the notion of these entities as discrete units, in practice like the atoms of Leucippus and Democritus, is always latent in the reasoning, and sometimes overt.[156] One may profess the infinitely small, the "infinitesimal" particles, but the limits of our ability of imagination tend at last to leave us with a discrete ultimate particle. And when the concept of discrete particles is to be combined with Anaxagoras' principle (3) *Everything Together,* then the impracticable problem of the infinite regress immediately emerges.

Did Anaxagoras actually not see this dilemma? The question has been repeatedly put. It seems inevitable that he did, if he thought in terms of particles. If he was to think of the principle of *Everything Together* in terms of particles that contain a part of everything, and these parts were in turn to contain parts of everything, and so on, Anaxagoras must finally have come to something pure, an unmixed final bit of elemental substance, an atom. This was the argument of Capelle (1919: 174).

But this reasoning is contradictory; it ruins the very principle of *Everything Together:* nothing can exist in total separation from anything else. Or, otherwise, nothing can be in juxtaposition with anything else. This obvious consequence of the reasoning must have appeared to Anaxagoras. And this fact should actually be reason enough for us not to think that he used the concept of particle at all.

On the assumption that matter is infinitely divisible, the concept of particle is dissolved. The concept of fixed magnitudes is eliminated. On B 3 and B 6 each thing is both large and small. There is no absolute magnitude. Such initial considerations by Anaxagoras should preclude his thinking in terms of particles. This may be what he tries to express in B 7 ὥστε τῶν ἀποκρινομένων μὴ εἰδέναι τὸ πλῆθος μήτε λόγῳ μήτε

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[155] E.g., *De caelo* 302 b 1 ἀέρα δὲ καὶ πῦρ μείγματα τούτων καὶ τῶν ἄλλων σπερμάτων πάντων· εἶναι γὰρ ἑκάτερον αὐτῶν ἐξ ἀοράτων ὁμοιομερῶν πάντων ἠθροισμένον.

[156] For example, Capelle 1919, Zafiropulo 1948.

ἔργῳ. But in what sense, then, did he use the terms μοῖρα and σπέρμα and the verbs ἀποκρίνεσθαι, συγκρίνεσθαι and others?

First, the principle (3) that everything is in everything implies that everything is everywhere, because nothing is separately in one place while other things are elsewhere. Everything in the universe is equal in magnitude with the universe. This fact is implied in B 12 begin. Speaking of the separate existence of νοῦς Anaxagoras states that, if it were mixed with something, it would be mixed with everything: εἰ μὴ γὰρ ἐφ' ἑαυτοῦ ἦν, ἀλλά τεῳ ἐμέμεικτο ἄλλῳ, μετεῖχεν ἂν ἁπάντων χρημάτων, εἰ ἐμέμεικτό τεῳ. Aristotle[157] also seems to suggest this idea: The totality is similar in all its parts.

We shall consider as a hypothesis that Anaxagoras thought of the primordial mixture as a set of strata of all ingredients, all extended overall in the infinite universe. Bröcker (1943: 178–180)[158] proposed such an interpretation, and Luria (1963: 103) illustrated the idea by the figure of a number of concentric circles.[159]

If the different ingredients of the universe are looked upon this way we get a vision of the totality, the unity of everything. Just this vision may have presented itself to Anaxagoras. He may well have imagined the universe as one homogeneous unit similar to the ἕν of Parmenides in regard to unity and coherence, but unsimilar with respect to the number of ingredients.

Now, if we take a sample of bits out of this unified bulk of matter, we shall find that each contains the same ingredients and all of them, irrespective of whether the bit is large or not. However small a bit we may examine its formation is the same. This could be the thought Anaxagoras expressed in B 6 καὶ ὅτε δὲ ἴσαι μοῖραί εἰσι τοῦ τε μεγάλου καὶ τοῦ σμικροῦ πλῆθος, καὶ οὕτως ἂν εἴη ἐν παντὶ πάντα.

The word μοῖρα has generally been taken to mean "portion", and not "part". Perhaps it could even better be rendered "feature". If the

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[157] *Phys.* 203 a 23 καὶ ὁ μὲν ὁτιοῦν τῶν μορίων εἶναι μῖγμα ὁμοίως τῷ παντὶ διὰ τὸ ὁρᾶν ὁτιοῦν ἐξ ὁτουοῦν γιγνόμενον.

[158] L.c., p. 180 "Jeder Same ist ein Elementarstoff, der die ganze Welt erfüllt, alle Samen durchdringen sich gegenseitig, so dass überall und jederzeit alle Samen beisammen sind."

[159] "Um uns die Gedanken des Anaxagoras zu verdeutlichen, können wir mehrere konzentrische Kreise und ihnen mehrere Radien zeichnen; dadurch wird der kleinste Kreis in ebensoviele Teile geteilt wie der grösste. Man braucht nur das kleinste Teilchen bis zur Dimension der ganzen Welt zu vergrössern und hat eine ebensolche Vielfalt vor Augen, wie sie in der Welt selbst existiert."

universal bulk of matter is looked upon as a unit, with its ingredients in fusion, this would be the meaning. There would be no particles that are in other particles. There is good reason to think that Anaxagoras used the term μοῖρα in the subtle sense of "feature".[160] His acceptance of the infinite divisibility of matter may well have inspired him to the concept of chemical fusion. A primitive concept of fusion had already been foreshadowed by Anaximander and partially by Empedocles. But in Empedocles' "fusion" the substances were in juxtaposition; he assumed that the elements could be, and actually were, entirely separated from one another. Anaxagoras' concept of fusion would differ from that of Empedocles just because of the infinite divisibility. It seems, then, that the concept of chemical fusion may have presented itself to Anaxagoras exactly as a consequence of his imagination of the infinitely divided matter. To express the participation of every ingredient in everything,[161] i.e., in every other ingredient, and in every part of the universe, there was probably no better word available to him than the fatal μοῖρα.

In the preceding chapter, we examined the various opinions of the status and function of the things (πάντα χρήματα) mentioned by Anaxagoras (B 1 and B 4 end) as being ingredients in the primordial mixture. We found that he stated three classes which must all of them be interpreted as parallel and thus elemental, namely the opposite qualities, the four traditional (Empedoclean) elements, and the σπέρματα.

Now, the considerations made above in this chapter appear to have shown that the old and still ongoing discussion of what the elements in Anaxagoras are is unnecessary, seeing that literally everything in his system is primary, and nothing is allowed to come into being, i.e., to be non-elemental. However, to enumerate the ingredients of the world is not enough. Anaxagoras, as well as his contemporaries, of course

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[160] The word is not seldom used in an abstract sense, cf. Herod. IV 145, 4 μοῖράν τε τιμέων μετέχοντες, Pind. *Ol.* 6, 79 ὃς ἀγῶνας ἔχει μοῖραν τ' ἀέθλων, *Ol.* 8, 86 ἀμφὶ καλῶν μοίρᾳ, *Pyth.* 3, 84 τὶν δὲ μοῖρ' εὐδαιμονίας ἔπεται, *Pyth.* 4, 196 φιλίαν νόστοιο μοῖραν, *Nem.* 10, 20 μοῖραν ἐσλῶν, *Nem.* 10, 53 ἀγώνων μοῖραν. In philosophic literature it was used as an abstract by Democrit. (DK 68 B 258) δίκης καὶ θάρσεος . . . ἐν παντὶ κόσμῳ μέξῳ μοῖραν μεθέξει, and B 263 δίκης καὶ ἀρετῆς μεγίστην μετέχει μοῖραν.

[161] We assume that the meaning of πᾶν is the same on both sides of the proposition ἐν παντὶ πάντα (B 4, B 6, B 11, B 12).

was expected to account for the functions of the world, to explain change and motion. This demand had become especially pressing through the paralyzing logic of Parmenides and his school. We are certainly entitled to posit that Anaxagoras did present a model for the emergence and disappearence of the perceptible things.

We shall begin with the problem of how Anaxagoras conceived of the so-called opposites. Is there evidence that Anaxagoras could have thought of them otherwise than as material substances? The answer should be given without great hesitation: he certainly could. Of course Anaxagoras, like other Pre-Socratics, thought of things as having abstract qualities. The σπέρματα are said (B 4 begin.) to have (ἔχοντα) ἰδέας παντοίας καὶ χροιὰς καὶ ἡδονάς, and in B 9 he speaks of τὴν ταχυτῆτα of (τῶν) περιχωρούντων τε καὶ ἀποκρινομένων on the one hand, and on the other of τῶν νῦν ἐόντων χρημάτων. The former are said to be πάντως πολλαπλασίως ταχύ. The νοῦς is called (B 12) αὐτοκρατές and λεπτότατόν τε πάντων χρημάτων καὶ καθαρώτατον and is said to be ὅμοιος. Further there are the qualifiers μέγα, σμικρόν, ἴσον, ἄπειρον, ἔνδηλον, ἄδηλον (B 21a), ἡ ἀφαυρότης, τὸ ἀληθές (B 21). Of course nobody ever thought that such qualities are material substances.[162]

However, this by no means proves that Anaxagoras also thought of the traditional opposites as abstract qualities.[163] He probably did not. The distinction between concrete and abstract had not yet been made in Anaxagoras' time, and he cannot be shown to have done it himself. With all his power of radical intellectual innovation, he seems to have been remarkably anxious to keep as much traditional thought as he possibly could. The fact that he included at least three, probably all four (see footnote 164), traditional elements in his system suggests this. It is certainly more likely that he thought of the opposites as substances. Let us assume, then, that he did.

The next group to be considered is ἀήρ, αἰθήρ (=πῦρ), ὕδωρ,[164] and

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[162] Stokes (1965: 11), speaking of B 4 begin., thinks that "the distinction between 'being' and 'having' a quality is not Presocratic". Indeed, this passage is evidence that it is. Such qualities as ἰδέα or ἡδονή were certainly never conceived of as substances.

[163] The conclusion drawn by Schwabe (1975) about the opposites, on the evidence that the σπέρματα "have" certain qualities, is unwarranted.

[164] Although ὕδωρ is not explicitly stated in the fragments as part of the primordial mixture (the word occurs, however, in B 16 and B 18), it seems reasonable to posit that Anaxagoras comprised it together with the other three.

γῆ. These, as well as the opposites, Anaxagoras probably takes in the traditional sense, i.e., simply as elemental substances, as they are in Empedocles. We need not be concerned about Aristotle's statements[165] that the Empedoclean elements are not elements in Anaxagoras' theory, but mixtures of the ὁμοιομερῆ. Aristotle was contrasting the two systems, and when he found that Anaxagoras did not consider the natural substances to be composed of the four elements as Empedocles did, he concludes that these must instead be composed (σύνθετα) or mixtures (μείγματα) of the former.

This description is a misrepresentation of Anaxagoras' doctrine. In B 1 and B 4 end he clearly states that ἀήρ, αἰθήρ, and γῆ are parts of the primordial stage; they are not in any way secondary formations, composed of anything else. *Nothing is secondary in Anaxagoras' system.* We have to believe him when he maintains (B 1) that ὁμοῦ πάντα χρήματα ἦν and (B 4) that at the beginning there was a σύμμιξις πάντων χρημάτων. Literally everything was there from the beginning, everything is elemental.

Now, in Anaxagoras' universe everything is mixed with everything. Consequently, it is meaningless to say that something is mixed in his system, as Aristotle does. And conversely, it is not possible to speak of anything in this system as simple in reality, but only in theory. As we saw above, Anaxagoras' system is in principle equivalent to that of Parmenides. But since there is nothing pure in Anaxagoras, Aristotle should actually have stated that there are no elements at all in this theory, seeing that he defined στοιχεῖον as a pure, simple (ἁπλόν) substance.

What is then the function of the four elements in Anaxagoras' system? When reading B 15 and B 16 one would think that they are not each of them distinct substances but rather different variants of one and the same substance. Anaxagoras seems to conceive of them as emerging from each other in a manner similar to Anaximenes' theory. But this is probably only a superficial similarity. On the evidence of B 1 och B 4 we must posit that Anaxagoras thought of them as distinct elemental substances, parallel to the opposite substances. In B 15 and B 16 Anaxagoras evidently tries to describe how he imagined the emergence of perceptible masses out of these substances. Through the

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[165] *De caelo* 302 b 1; *De gen. et corr.* 314 a 29. – Simpl. *In Phys.* 27, 5 represents Anaxagoras' doctrine better: πάντα γὰρ τὰ ὁμοιομερῆ, οἷον ὕδωρ ἢ πῦρ ἢ χρυσόν, ἀγένητα μὲν εἶναι καὶ ἄφθαρτα.

mixture of the opposites *and* the other four elements in various proportions each of these emerges to become perceptible. There is a need of such substances as the four elements. The opposites alone can never combine to form a perceptible mass. Substances such as earthiness and wateriness and aeriness and fieriness do exist.[166] The combination of these and the opposites in appropriate proportions makes them perceptible to us. Thus B 15 and B 16 illustrate how everything emerges out of everything, besides B 10, which is generally referred to as the fragment that illustrates this.[167]

In B 1 Anaxagoras speaks of ἀήρ and αἰθήρ in a curious way. He takes the two substances together and states that they "held down" (κατεῖχεν sing.) everything. The meaning of this statement has been much discussed.[168] The last sentence of the fragment is possibly a clue to the solution. The two substances are both said to be μέγιστα καὶ πλήθει καὶ μεγέθει. The phrase is rather illogical: μέγιστα μεγέθει is tautology. However, Anaxagoras probably tried to express that the two substances were represented in the mixture in greater quantity than the other ones.[169] This does not imply that there was some place in the mixture in which some one of the ingredients was present in a higher concentration than elsewhere. The universal primordial mixture was most probably thought of by Anaxagoras as an absolutely homogeneous fusion, as we suggested above. There was no structure in this universal fusion. If we look upon the universal mixture as one entity in this way, we find that this immense "thing" will turn out to be parallel to each of the perceptible things of the cosmos stage. Of these

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[166] Such a conception of substantiality was also credited to Anaxagoras by Strang (1963: 110–111), and his view was supported by Guthrie (1965: 291). However, by the substances beside the opposites they meant the ὁμοιομερῆ.

[167] It is not necessary to think that Anaxagoras intended that everything emerges *directly* out of everything. In B 16 he seems to express his thought that the perceptible mass of γῆ, and even λίθοι, emerge out of ἀήρ (represented in the form of νεφέλαι) through the intermediate stage of ὕδωρ. For such a process explained by the theory of the σπέρματα, see below, pp. 88–89.

[168] As an example of an impossible interpretation, see Zafiropulo 1948: 378, n. 6 "C'est-à-dire que la qualité d'air et d'éther déjà créée maintenait loin les uns des autres les σπέρματα restant, les empêchant ainsi de s'agglomérer." Zafiropulo conceives of the σπέρματα as distinct particles scattered about in the universal mixture, which is impossible, because in Anaxagoras' theory everything is together. Furthermore, there is no need of any restraint to prevent motion because, until νοῦς had initiated motion, the mixture was inert.

[169] A greater quantity is perhaps also suggested (B 4 end) for γῆ: γῆς πολλῆς ἐνεούσης.

things Anaxagoras tells us (B 12 end) not only that they are mixed, but also that they "are and were that of which there is most in each of them".[170] This parallellism is thus further evidence of Anaxagoras' conception of the universe as *one* entity, although composed of a number of ingredients in an inseparable mixture.

It remains to consider the must crucial issue in Anaxagoras' theory of matter, the status and function of the σπέρματα. Since the term occurs only twice in the fragments (both instances in B 4) the interpretation is problematic indeed. This is even more so, seeing that the presentation of these entities is far from lucid.

After Aristotle (*De caelo* 302 b 1) had represented the σπέρματα of Anaxagoras as synonymous with his own ὁμοιομερῆ, and also suggested that they are particles of these, the commentators have tried a variety of different interpretations of the term. It is thought of as

(1) the natural substances (ὁμοιομερῆ) in their totality (Bröcker, Giussani, Strang, Kerferd, Schwabe),

(2) (molecular) parts of these substances (Tannery, Burnet, Brieger, Giussani, Gomperz, Peck, Cornford, Vlastos),

(3) molecular parts of the universal mixture (Bailey),

(4) particles of pure substances,[171] (Capelle, Zafiropulo, Cleve, Schwabe),

(5) growth-points for the building up of natural substances in pre-perceptible quantities (Peck,[172] Vlastos,[173] Raven, Guthrie, Stokes),

(6) natural seeds originating the species of plants and animals (Schofield).

We have seen in the preceding chapter that none of these alternatives is in accord with Anaxagoras' own words on all points. When all his principles are taken into consideration problems inevitably arise. The following main problems are intrinsically connected with these interpretations:

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[170] This is the Principle (6) *Predominance,* which is thus, in this interpretation, already stated in the first fragment, together with all the other principles of the system.

[171] In this interpretation σπέρμα is sometimes identified with μοῖρα (e.g. Schwabe and Cleve (1965: 189, n. 1)).

[172] Only at the beginning of his article (1926) does he contend this interpretation.

[173] Vlastos (1950) proposed such a view (similar to Peck's), but in his further discussion of the concept of σπέρμα he drops this interpretation for the common molecule conception.

(a) the particle conception (alternatives 2, 3, 4, 6, and partly 5),

(b) the infinite multitude of natural substances (alternative 1) or of species of plants and animals (alternative 6),

(c) the infinite multitude of dissimilar particles to build up homoeomerous substances (alternatives 2, 3, 4, and partly 5),

(d) the concept of σπέρμα in the sense of universal substance (alternative 1), or particle of a pure substance (alternative 4), or natural seed (alternative 6),

(e) the initiation of the cosmogonic process out of a homogeneously fused mixture of infinitely small particles (discussed by Raven, Guthrie, and Stokes).

(f) no explanation of how things in the universe other than living organisms could emerge and receive their form (alternative 6).

Among the alternative definitions of the meaning of the σπέρματα the fifth one, that they are growth-points, seems to be less improbable than the others. The objections against these are decisive: each of them is in conflict with Anaxagoras' own words and with the general logic of his system. Unless we are to tolerate glaring inconsistencies in his doctrine, the first four interpretations are ruled out.

The fifth alternative, the concept of growth-points, is very interesting, although in the interpretation proposed by Stokes (1965: 15) it is open to decisive objections. He thinks of them as mixed particles which aggregate to form perceptible substances. This model is no better than alternative (2): calling the particles growth-points makes no difference.

Peck (1926) and Vlastos (1950) have a similar conception of the σπέρματα as growth-points. One difference as against Stokes is the assumption that the σπέρματα are nourished by the opposites.[174] Another one is the notion of the σπέρματα as matrices capable of governing the growth of natural substances out of them. Vlastos emphasizes (p. 34) the fact that Anaxagoras chose exactly this term and establishes (p. 36) that "whatever is generated *from* a seed was *in* the seed" (italics original). And he continues (p. 39) speaking of "*how* Anaxagoras conceived of the pre-existence of all these substances in the cosmic matrix. They are there as seeds."

Peck (p. 62) uses the words "controls – almost 'informs' – the material" when describing the power of the seed, thus suggesting a

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[174] Peck (l.c., p. 61) "The word 'Seed' suggests a principle of organic growth rather than mere mechanical aggregation, just as the notion of Mind does."

notion of something more than simply a particle of a substance.

Curiously enough both expositors drop their advanced conception of seed in their further discussions and relapse into the traditional way of thinking, namely of particles aggregating into natural substances.

There are other instances of such a tendency to interpret the term σπέρμα in a pregnant sense.[175] Many commentators have found it significant that the word has a biological connotation and thus is not likely to mean simply "particle" or "bit" of a substance. But this line of thought was never prosecuted by anyone except Schofield (1980); otherwise the traditional view always prevaled.

Anaxagoras (B 4) offers two significant pieces of information about the σπέρματα πάντων χρημάτων: (1) they are infinitely numerous and (2) they are each of them distinctly qualified in three respects, ἰδέα, χροιή, and ἡδονή, so that none is like any one of the others in the infinite multitude.

It should be fairly clear that σπέρματα do not denote a natural substance, e.g., flesh or bone, in its totality, nor particles of it. Instead, we shall try the following interpretation:

According to his rigid understanding of the principle (1) *No Becoming,* Anaxagoras had to present a theory in which literally everything existed *ab aeternitate.* This implies that even all the individual things, each with its specific individual qualities, must have elemental status. Anaxagoras solved the problem by positing the σπέρματα πάντων χρημάτων as *prefigurations,* or *matrices, of individual perceptible things,* inorganic as well as organic, with one σπέρμα for each individual thing of the universe. Being a prefiguration or matrix a σπέρμα has all the qualities of its proper future state of individual thing. It *is* the thing in a pre-perceptible stage. No two sense things are exactly alike; consequently no two σπέρματα are exactly alike. Each has its unique composition of variants of ἰδέα, χροιή, and ἡδονή. These words prob-

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[175] Gigon (1936: 28) "Die Samen sind endlich alle voreinander verschieden. Dies wird so auffallend hervorgehoben, dass man an ein bestimmtes Theorem denken möchte." Jöhrens (1939: 30) "Die σπέρματα existieren nicht etwa neben vielen und ganz verschiedenen anderen Dingen, sondern es sind dieselben Dinge von einer anderen Seite her betrachtet. In die Zukunft gesehen, sind es Keime für alle anderen so ganz verschiedenen Dinge. Von ungefähr entsteht nichts . . ." Calogero (1967: 277) "Realtà esistenti, per lui, erano quelle che poi sarebbero state chiamate le 'sostanze', e che in quanto 'semi' destinati a crescere avrebbero poi originato le idee della 'potenza' e della 'entelechia'; ma realtà, allo stesso modo, erano anche gli 'attributi', le 'qualità', ciascuna delle quali doveva pur preesistere là di dove poi sembrava 'nascere'.

ably have a rather general and original meaning:[176] ἰδέα, "shape", "form of the outlines"; χροιή, "skin", "(condition of the) surface", (e.g., colour, softness, hardness, etc.); ἡδονή, "pleasant sensation", "degree of pleasantness of sensation".

By these three words Anaxagoras seems to have intended to cover all groups of perceptual criteria, by which things are identified. If this is so, it is significant that he uses these criteria about the σπέρματα. Thus he defines them as individual things.

The interpretation of the σπέρματα as referring to individual things is based on two arguments, (1) they cannot be taken to mean natural substances or parts of these, because that interpretation is in conflict with Anaxagoras own words and, (2) the evidence of B 4 end and B 12 end.

Having stated (B 4 end) that the σπέρματα are all unlike one another, Anaxagoras says in the next sentence:[177] οὐδὲ γὰρ τῶν ἄλλων οὐδὲν ἔοικε τὸ ἕτερον τῷ ἑτέρῳ. The "other things" must be something else than the "things" just mentioned, the opposites, γῆ, and σπέρματα. Unless we would think that Anaxagoras meant the other three Empedoclean elements, the reference must be to the perceptible things. This conclusion is further evidenced by B 12 end: νοῦς δὲ πᾶς ὅμοιός ἐστι καὶ ὁ μείζων καὶ ὁ ἐλάττων. ἕτερον δὲ οὐδέν ἐστιν ὅμοιον οὐδενί, ἀλλ' ὅτων πλεῖστα ἔνι, ταῦτα ἐνδηλότατα ἦν ἕκαστόν ἐστι καὶ ἦν.

Here it cannot be doubted that the individual things are meant. In B 4 Anaxagoras states the dissimilarity of the σπέρματα on the one hand, and of the sense things on the other. In B 12 he explains *how* the latter can all be unlike each other, namely on the principle (6) *Predominance*. The two passages go together.

We now have to consider how perceptible things develop out of the growth-points, the σπέρματα. The processes stated by Anaxagoras[178] as accomplishing this development are: περιχώρησις (initiated by νοῦς), ἀπόκρισις, πρόσκρισις, σύμμιξις, σύγκρισις, συγχώρησις, σύμπηξις, and διάκρισις. Everything is not explicitly said to partake in all processes. The substances that are stated as partaking in the proces-

[176] Cleve (1965: 185–186) is probably right in suggesting that the meaning of these words in this context is not rendered correctly in the translations.

[177] Simpl. *In Phys.* 156, 8 cited the two sentences successively, while in 34, 25 he left out the second sentence. The connection of the sentences can thus be disputed but this is not decisive for our argument which is supported by B 12 end.

[178] Anaxagoras states them either by using the noun or the verb or both.

ses are: ἀήρ and αἰθήρ (B 2, B 12), γῆ (B 4, B 16), ὕδωρ (B 16), and the opposites (B 4, B 8, B 12, B 15, B 16). Other things are also mentioned: τὰ ἄστρα, ὁ ἥλιος, and ἡ σελήνη are said to be ἀποκρινόμενοι and to περιχωρεῖν (B 12), and ἄνθρωποι καὶ τὰ ἄλλα ζῷα, ὅσα ψυχὴν ἔχει are said (B 4 begin.) to συμπαγῆναι. Speaking of things involved in the processes Anaxagoras also uses general expressions: ἐν πᾶσι τοῖς συγκρινομένοις (B 4), τὰ συμμεμειγμένα (B 12), ἐν τοῖς προσκριθεῖσι καὶ ἐν τοῖς ἀποκεκριμένοις (B 14).

The σπέρματα are said (B 4 begin.) to be present ἐν πᾶσι τοῖς συγκρινομένοις. This should be especially noted, for it is observed that Anaxagoras never states the natural substances as involved in the processes. Only in B 10 are natural substances mentioned as involved in a generative process. But the verb used is γίγνεσθαι. This is worth noticing, considering that Anaxagoras does not use this verb except in B 17 where it is condemned (together with ἀπόλλυσθαι): οὐδὲν γὰρ χρῆμα γίνεται οὐδὲ ἀπόλλυται. The question immediately presents itself: why did not Anaxagoras use ἀποκρίνεσθαι in B 10? Is the different choice of verb significant? It probably is. The processes just discussed do not seem to apply to natural substances as such but only to those substances explicitly stated by Anaxagoras as participants, and specifically to the σπέρματα. These thus appear not to be identical with the natural substances. Problems connected with B 10 and the natural substances shall be discussed below.

With the many terms of processes Anaxagoras describes the structuring of the absolutely homogeneous primordial mixture. There is a transportation of substances to some points in the mixture. The result is the growth and emergence of perceptible things. Since matter is infinite in quantity, and the growth-points, the σπέρματα, are infinite in number, the possible number of sense things is naturally infinite.[179] In B 4 Anaxagoras suggests that there are other worlds besides our own. The passage is generally taken to mean other parts of the surface of the earth.[180] It would be logical, however – considering Anaxagoras'

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[179] The structuring goes on and shall go on: B 12 ἐπὶ δὲ πλέον περιχωρεῖ, καὶ περιχωρήσει ἐπὶ πλέον.

[180] For a discussion, see Guthrie (1965: 314). The most common opinion is that Anaxagoras believed in a unique cosmos (so also Simpl. *In Phys.* 178, 25), but cf. *In Phys.* 157, 16 καὶ ὅτι μὲν ἑτέραν τινὰ διακόσμησιν παρὰ τὴν παρ' ἡμῖν αἰνίττεται, δηλοῖ τὸ 'ὥσπερ παρ' ἡμῖν' οὐχ ἅπαξ μόνον εἰρημένον. Simplicius leaves the question unanswered.

extensive use of the concept of infinity – if he actually posited other worlds besides our own. His emphatic expression in B 8 οὐ κεχώρισται ἀλλήλων τὰ ἐν τῷ ἑνὶ κόσμῳ does not preclude that he imagined many formations, each containing earth, sun, moon, and planets, within the one cosmos.

It should be observed that Anaxagoras (B 4) uses the verb συμπήγνυσθαι of the emergence of men and animals. They emerge as perceptible things quite mechanically and by the same processes as other things, for example γῆ or λίθοι (B 16). The processes go on automatically. They are not governed specifically by νοῦς.[181] In B 12 Anaxagoras describes how νοῦς initiated the περιχώρησις in the primordial mixture, namely ἀπό του σμικροῦ. However, νοῦς did not simply start motion. *Before* doing that, νοῦς had disposed of the coming development in each and every detail; νοῦς had programmed the emergence of every individual perceptual thing in the universe.[182] That the programming was accomplished before motion was started is suggested by the aorists, ἔγνω and διεκόσμησε, and the statement ἡ δὲ περιχώρησις αὐτὴ ἐποίησεν ἀποκρίνεσθαι. The cosmos with all its innumerable things develops automatically, once the circulation has been initiated by νοῦς. Everything is determined in detail.

If, on the one hand, νοῦς has knowledge of everything that happens in the development of the cosmos and, on the other hand, need not directly govern the processes, this evidently means that there must have been some kind of governing devices, already programmed in detail, present in the primordial mixture at the moment when νοῦς initiated the cosmogonical evolution by starting a περιχώρησις which was to function automatically.

The problem of how the cosmogonical process could begin in an absolutely homogeneous fusion of matter is thus solved: There existed in it innumerable programmes, one for each individual sense thing to emerge. These, as well as νοῦς and all substances, were there *ab aeternitate*. The cosmos stage had been prefigured, and thus *has always existed as programmes or matrices,* the σπέρματα. The sense things of the cosmos are then formed through the concentration of all kinds of substances, namely the opposites and the four Empedoclean elements,

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[181] Eudemus *ap.* Simpl. *In Phys.* 327, 26 καὶ 'Αναξαγόρας δὲ τὸν νοῦν ἐάσας, ὥς φησιν Εὔδημος, καὶ αὐτοματίζων τὰ πολλὰ συνίστησι.

[182] B 12 καὶ ὁποῖα ἔμελλεν ἔσεσθαι καὶ ὁποῖα ἦν, ἅσσα νῦν μὴ ἔστι,καὶ ὅσα νῦν ἐστι καὶ ὁποῖα ἔσται, πάντα διεκόσμησε νοῦς, καὶ τὴν περιχώρησιν ταύτην . . .

onto these points. The proportions of the ingredient substances of each thing is determined by the programmes of the individually dissimilar σπέρματα. The final apparition of the thing means the accomplishment of the programme of its σπέρμα.

In the discussion of Anaxagoras' theory, cosmogony has always been the main point. But Anaxagoras not only accounted for the emergence of the things of the world but also explained their disappearance. In other words, his theory was designed to explain change in all its aspects. This is seen in B 17 τὸ δὲ γίνεσθαι καὶ ἀπόλλυσθαι οὐκ ὀρθῶς νομίζουσιν οἱ Ἕλληνες· οὐδὲν γὰρ χρῆμα γίνεται οὐδὲ ἀπόλλυται, ἀλλ' ἀπὸ ἐόντων χρημάτων συμμίσγεταί τε καὶ διακρίνεται. καὶ οὕτως ἂν ὀρθῶς καλοῖεν τό τε γίνεσθαι συμμίσγεσθαι καὶ τὸ ἀπόλλυσθαι διακρίνεσθαι.

The rhetoric question forming the fragment B 10 was apparently part of a discussion of the principle (3) *Everything Together,* which is evidenced *passim* in the fragments.[183] But B 10 differs from the other passages where this principle is mentioned; in B 10 Anaxagoras seems to illustrate the principle by a concrete example. What did he mean, then, by this example? Is the traditional opinion correct, namely that he thought of particles of natural substances being present in other natural substances, which could be separated out and aggregated to form perceptible masses of such natural substances? Is this model compatible with the principle of *Everything Together* as evidenced by B 8 οὐ κεχώρισται ἀλλήλων τὰ ἐν τῷ ἑνὶ κόσμῳ οὐδὲ ἀποκέκοπται πελέκει οὔτε τὸ θερμὸν ἀπὸ τοῦ ψυχροῦ οὔτε τὸ ψυχρὸν ἀπὸ τοῦ θερμοῦ, and B 6 where this principle is derived from the principle of *Infinite Divisibility:* οὐδὲ χωρὶς ἔστιν εἶναι, ἀλλὰ πάντα παντὸς μοῖραν μετέχει. ὅτε τοὐλάχιστον μὴ ἔστιν εἶναι, οὐκ ἂν δύναιτο χωρισθῆναι, οὐδ' ἂν ἐφ' ἑαυτοῦ γενέσθαι, ἀλλ' ὅπωσπερ ἀρχὴν εἶναι καὶ νῦν πάντα ὁμοῦ.

It seems clear that the answer is in the negative. The things of the world are not autonomous; there are no intervals between them; everything was and *is* a continuum (B 6) ὅπωσπερ ἀρχὴν εἶναι καὶ νῦν πάντα ὁμοῦ. Discission, or abscission, cannot be in Anaxagoras' universe.

But, if so, how did he conceive of the transportation of matter and what is the meaning of B 10?

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[183] B 1, B 4, B 6, B 8, B 11, B 12, B 13.

To answer the former question we must try to follow Anaxagoras in eliminating the concept of particle. In a continuum of matter without discrete particles, transportation must be thought of as a flow, or a current. Perhaps our concept of energy is approximately what dimly presented itself to the imagination of Anaxagoras. Through his many terms of processes he made efforts to express his new thoughts. To clarify the universal mutual participation of all kinds of matter in everything he happened to choose the word μοῖρα which, as we discussed above, pp. 75–76, should perhaps be rendered "feature". This word may have been fatal to the understanding of his theory, because it is naturally associated with the concept of particle.

This may also have been the case with expressions like B 10. Of course, we must try to understand even this fragment without thinking in terms of particles. Let us try the following way: Since everything is everywhere in the universe, the σπέρματα are present in every point, thus constituting the possibility of emergence of whatever sense thing everywhere. When a sense thing is growing from a growth-point, a σπέρμα, this is done through transportation of matter to it. This means that other sense things, from which the matter is taken, are dissolved. They are gradually ruined and finally disappear. Their "life-time" as sense things comes to an end.

Take, for instance, a piece of bread. Whether we eat it or not, it does not keep its state of sense thing unaltered. It will sooner or later dissolve into other things. If it happens to come into our stomach the dissolution process immediately begins. How exactly Anaxagoras thought of this process we can, of course, only surmise. There are at least two alternatives: either matter is attracted directly to different parts of the body by the different σπέρματα in power there, for example the different kinds of flesh, bone, hair, nails, etc; or the σπέρματα for the formation of such substances present in the piece of bread attract matter from it and develop into bits of each substance. These in turn are then transported to and amalgamated with the substances of the body, each with its proper substance.

The latter alternative seems to be less probable since the small bits of substance would then be small individual things, which would mean an unnecessary redundancy. Nevertheless, this model seems to be reflected by Aristotle.[184]

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[184] *De gen. anim.* 723 a 10 'Αναξαγόρας μὲν γὰρ εὐλόγως φησὶ σάρκας ἐκ τῆς τροφῆς προσιέναι ταῖς σαρξίν.

We should now consider B 16 and compare it with B 10. The latter fragment has always been discussed intensively because it is looked upon as evidence of the Aristotelic ὁμοιομερῆ interpretation. B 16, on the other hand, is seldom mentioned at all, still less analysed and discussed, in spite of the fact that it appears to form a parallel to B 10 in so far as it, too, is about the emergence of things out of other things. Thus, in B 16 Anaxagoras describes how the sense things ὕδωρ, γῆ, and λίθοι emerge through increasing addition of τὸ ψυχρόν. Although he mentions only this quality in this fragment we may assume on the evidence of B 15 that he also meant that other qualities, e.g., τὸ πυκνόν, τὸ διερόν, and τὸ ζοφερόν, are involved by their formation.

From B 1 and B 4 end we know that Anaxagoras counted at least three Empedoclean elements among the elemental substances of his theory. The homonymous sense things, however, are formations determined by the σπέρματα, one for each individual piece of them,[185] which is distinctly formed, having ἰδέα, χροιή, and ἡδονή. Onto these σπέρματα various quantities of the four elements and the opposites are transported to build up the thing.

From B 1 and B 4 we also know that the natural substances are not mentioned explicitly among the elements. But, as we have established, everything is elemental in Anaxagoras' theory. Consequently, the natural substances must be represented by the σπέρματα, one for each individual piece of them, defined by the individual qualities just mentioned. A thing or piece of natural substance is formed according to its programme or matrix through concentration of the four elements and the opposites in various proportions.

Through the reorganization of these substances onto other σπέρματα, these produce new sense things and the old ones dissolve and disappear. This reorganization is probably what Anaxagoras means by the apparent series of development in B 16: through successive reorganizations onto other σπέρματα the development produces a series of sense things. One thing, for example a piece of earth of a certain constitution, exists for a certain period of time, then another σπέρμα, say one of porous stone, attracts some of its ingredient kinds of matter and grows to form such a stone. This thing can then be

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[185] That Anaxagoras contended that each individual thing was present in the primordial mixture is perhaps suggested by Aristotle, *Phys.* 203 a 25 ἐντεῦθεν γὰρ ἔοικε καὶ ὁμοῦ ποτε πάντα χρήματα φάναι εἶναι οἷον ἥδε ἡ σάρξ καὶ τόδε τὸ ὀστοῦν, καὶ οὕτως ὁτιοῦν· καὶ πάντα ἄρα· καὶ ἅμα τοίνυν· ἀρχὴ γὰρ οὐ μόνον ἐν ἑκάστῳ ἔστι τῆς διακρίσεως, ἀλλὰ καὶ πάντων.

transformed, say, into a compact stone, or be reduced to a form of earth again through proper changes in the ingredient proportions of the four elements and the opposites.

These reorganizations go on for ever, because the number of σπέρματα is infinite. In B 12 Anaxagoras suggests that νοῦς has foreseen this eternal evolution of the universe in detail so that every thing has its programmed period of time to be in the perceptible stage; it grows, reaches its ἀκμή, and then dissolves and disappears.

We shall now put the crucial and important question: How exactly did Anaxagoras imagine the σπέρματα? Did he think of them as discrete units of matter, similar to organic seeds, or did he conceive of them otherwise? It is not possible to decide upon this question on the evidence of the fragments. We are thrown upon the estimation of the general level of logical and philosophical capacity observable in the fragments.

One is prone, indeed, to interpret the σπέρματα as discrete units, scattered about everywhere in the universe. Anaxagoras appears literally to have posited the sense things – in the form of the σπέρματα – in the primordial, universal mixture of infinitely divided matter. But how could he possibly have committed such a flaw, after having reasoned with superior subtlety and abstraction to reach the concept of the absolutely homogeneous fusion of the material ingredients? Is it to be expected that, nevertheless, he relapsed into terms of particles and was able to permit a distinct unit to exist in the fusion? More exactly, he would have to allow for an infinite multitude of such units, all being in all of them...

This line of thought ought to have presented itself even to Anaxagoras, and its grotesque consequences must have been obvious to him. It is thus not probable that he meant the σπέρματα to be discrete units. Such an assumption is glaringly against logic in general and particularly that of Anaxagoras' theory. But, granted that he actually thought of them as discrete, concrete units of matter containing all the qualities of these things into which they are to develop, i.e., being embryos or germs[186] of organic (as well as inorganic) entities, this would mean that

[186] Cf. Irenaeus II 14, 2 (DK 59 A 113) Anaxagoras autem... dogmatizavit facta animalia decedentibus e caelo in terram seminibus. Theophr. *Hist. plant.* III 1, 4 (DK 59 A 117) 'Αναξαγόρας μὲν τὸν ἀέρα πάντων φάσκων ἔχειν σπέρματα καὶ ταῦτα συγκαταφερόμενα τῷ ὕδατι γεννᾶν τὰ φυτά.

These reports are in glaring conflict with Anaxagoras' own words in B 4: καὶ

Anaxagoras was a rather capricious thinker. For it would be nearly incomprehensible that he was able to devise the complex, infinitely divided and mixed universe, if he could accidently place such gross units in the middle of it and thus turn out to the quite muddleheaded.

We shall do well not to depreciate Anaxagoras as a philosopher. It is probable that he was able to continue his abstract line of thought and think of the σπέρματα as something in some way different from material substance. Their abstract qualities, ἰδέα, χροιή, and ἡδονή, suggest that Anaxagoras may have conceived of them as forms, not very unlike the εἴδη of Aristotle. Anaxagoras probably meant that the σπέρματα combine with the material substances to form perceptible things. Everything in the world has a form. No thing can emerge unless on the basis of a form, a programme, because otherwise the structuring of the ingredient substances in the correct proportions would not be possible. Since all the characteristics of the individual things are also the characteristics of its σπέρμα, the σπέρμα can be said to *be* the thing. It is a thing even when it is not in the perceptible stage. We may assume that Anaxagoras did not think of the σπέρματα as only possible, but actual, real things, the things themselves.[187]

But how did Anaxagoras imagine these entities? Did he think of them as incorporeal or not, as extended in space or not? First, a σπέρμα can certainly not have a fixed size. There is nothing to suggest that Anaxagoras did not consider the infinite divisibility to be general.

Before we decide upon how Anaxagoras may have imagined the σπέρματα, we shall consider how he conceived of νοῦς, whether as incorporeal or corporeal. This question has been much discussed. Some commentators decide upon one alternative, others choose the other.[188] This fact is itself evidence that the question cannot be answered with any certainty.[189] Guthrie (1965: 279) summed up his considerations and rightly stated that νοῦς is "if not imagined as completely

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ἀνθρώπους τε συμπαγῆναι καὶ τὰ ἄλλα ζῷα ὅσα ψυχὴν ἔχει. Cf. above, p. 85.

[187] Arist. *Metaph.* 1069 b 20 complaints that Anaxagoras conceived of the things this way: ἐξ ὄντος γίνεται πάντα, δυνάμει μέντοι ὄντος, ἐκ μὴ ὄντος δὲ ἐνεργείᾳ καὶ τοῦτ' ἔστι τὸ 'Αναξαγόρου ἕν (βέλτιον γὰρ ἢ ὁμοῦ πάντα) καὶ 'Εμπεδοκλέους τὸ μῖγμα καὶ 'Αναξιμάνδρου, καὶ ὡς Δημόκριτός φησιν, ἦν ὁμοῦ πάντα δυνάμει, ἐνεργείᾳ δ' οὔ.

[188] Νοῦς was looked upon more or less decidedly as corporeal by Zeller, Burnet, Capelle, Jöhrens, Luria, and Raven, while it was considered incorporeal by, among others, Ciurnelli, Zafiropulo, Romano, and Gershenson-Greenberg.

[189] It is of course not decisive that Anaxagoras was classed by the doxographers among the dualists. Cf. Simpl. *In De anima* 30, 29 ἀσωμάτους δὲ οἱ Πυθαγόρειοι καὶ Πλάτων, μίξαντες δὲ ἀπ' ἀμφοῖν 'Εμπεδοκλῆς καὶ 'Αναξαγόρας.

incorporeal, it is very nearly so, and Anaxagoras has adopted every means at his command to contrast it with the material."

This is probably approximately the truth. If Anaxagoras' νοῦς is compared with Empedocles' φιλότης and νεῖκος, it appears evident that Anaxagoras thought of νοῦς in a more abstract way, although we cannot be sure that he conceived of it clearly as incorporeal. We should be cautious not to credit him with an exact apprehension of this concept. Anaxagoras' thought seems to have been at a transient stage between the older philosophy and the following, advanced thought represented by Plato and Aristotle. There is an oscillation between corporeality and incorporeality in Anaxagoras' theory.[190] The concepts of νοῦς and σπέρματα are probably not either corporeal or incorporeal; they oscillate between the two. This is not to detract from the qualities of his theory; we should be careful not to expect to find distinctions and concepts which did not yet exist at that times. But we will do well to search for tendencies or intellectual embryos of a more sophisticated way of thinking. And such tendencies appear to be traceable in Anaxagoras.[191]

If Anaxagoras' σπέρματα are such semi-incorporeal entities, then his theory may well have inspired Plato and Aristotle to attain their own abstract concept of form. There is a touch of this way of thinking in Anaxagoras. But there is also a tendency towards corporeality and even particularization in his doctrine. Indeed, his terminology[192] is in part misleading and even fatal to the understanding of his intentions. It was probably quite possible to misunderstand the cardinal points of his theory. Especially his new and apparently not quite explicitly defined concept of σπέρμα may well have been distorted by his critics.

Shall we think that Plato and Aristotle also misunderstood him or did they misrepresent his doctrine? Commentators mostly tend to

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[190] Such an oscillation is observable even in the earlier Pre-Socratics, for example in Heraclitus, Xenophanes, Parmenides, and the Pythagoreans.

[191] Bröcker (1943: 186) probably understood the relationships correctly between νοῦς, σπέρματα, and the rest of the ingredients in Anaxagoras' primordial mixture: "Die 'Materie' des Anaxagoras ist nicht, was wir unter Materie zu denken gewohnt sind, eine passive Masse, die von etwas anderem Gestalten aufgeprägt erhält, sondern sie ist gleichsam trächtig mit Bildern, sie ist das eigentlich produktive Prinzip, geladen mit Gestalten, die in ihr verborgen sind. Der νοῦς bringt nichts von aussen hinzu, sondern leistet nichts anderes, als den verborgenen Reichtum dieser Mutter Natur zu befreien und ans Licht der Wahrheit zu bringen."

[192] Especially μοῖρα, and the terms for the processes of transportation of matter, ἀποκρίνεσθαι, προσκρίνεσθαι, etc.

decide either for or against such views. But instead of trying to answer this question we should be content to make clear the fact that neither of these was a doxographer: we should not expect to find objective representations of competing systems in philosophers who are themselves propagating new and controversial doctrines. That is to say, it is quite possible that their representations of Anaxagoras' doctrine may be true on some points, but also that they may not.

Take one example, the role played by νοῦς. In one respect there is a consensus in both philosophers: they both censure Anaxagoras for using νοῦς only as an ultimate cause of motion and thus making cosmogony entirely mechanical, and change in general plain and automatic. Plato's criticism is sarcastic and totally negative,[193] while Aristotle is less reproachful.[194]

Plato may have exaggerated this part of the doctrine because he – or perhaps primarily Socrates – was disappointed with Anaxagoras' lack of interest in ethics and teleology. Aristotle, for his part, was apparently not so upset by exactly this feature of the system and was able to comment upon it in positive terms.

But, as we have seen, Aristotle is mostly rather severe in his reviews of Anaxagoras' theory in general. He represents it as inconsistent and contradictory. In *Phys.* 187 a 20–188 a 18 we can establish that he deliberately misrepresents his theory, through his rejection of the principle of *Infinite Divisibility,* and so succeeds in making the doctrine appear ridiculous.

With this negligence of one of Anaxagoras' most important principles, Aristotle has shown that we must be very careful not to believe everything he reports about the theory. But first and foremost, we should probably beware of supposing that Aristotle did not understand Anaxagoras. Zafiropulo (1948: 280) rightly thought that "nous serions bien plus tentés de suspecter la bonne foi du péripatéticien plutôt que son intelligence."

Aristotle could well have had a personal interest in trying to detract from Anaxagoras' doctrine. The school founded by the latter at Lamp-

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[193] Plat. *Phaed.* 97C–98D.

[194] *De anima* 404 b 1 'Αναξαγόρας... πολλαχοῦ μὲν γὰρ τὸ αἴτιον τοῦ καλῶς καὶ ὀρθῶς τὸν νοῦν λέγει. Id. *Metaph.* 985 a 18 'Αναξαγόρας τε γὰρ μηχανῇ χρῆται τῷ νῷ πρὸς τὴν κοσμοποιίαν καὶ ὅταν ἀπορήσῃ διὰ τίν' αἰτίαν ἐξ ἀνάγκης ἐστί, τότε παρέλκει αὐτόν, ἐν δὲ τοῖς ἄλλοις πάντα μᾶλλον αἰτιᾶται τῶν γιγνομένων ἢ νοῦν.

This description as a whole, and especially the word πάντα, seem to reflect the function of the σπέρματα as etiological devises in Anaxagoras' theory.

sacus was still at work in the fourth century. Unfortunately we know nothing of how the doctrine of the master was rendered by his followers at that time. It may already have been misrepresented on some points, perhaps through contamination with the Atomistic theory, as we know that it finally was.[195] If, for instance, the particle conception had already entered from Atomism, Aristotle could dare to misrepresent the true doctrine of the Clazomenian without running the risk of being censured for this.

Unfortunately, however, these suggestions cannot be verified because we know nothing of the opinions held by the adherents of the school of Lampsacus at Aristotle's times. It is, of course, possible that his doctrine had already been labelled with the concept of ὁμοιομέρεια, "similarity of parts everywhere in the universe".[196] If so, Aristotle's use of his own concept of ὁμοιομερῆ in discussing the doctrine of Anaxagoras would seem natural. Nevertheless, this would be a further example of negligence on his part, because he uses the term ὁμοιομερῆ in his own specialized sense. Shall we assume that he did, without stating the difference of meaning?

However this may be, it seems rather probable that Aristotle was influenced by Anaxagoras. One reason for his identification of Anaxagoras' σπέρματα with his own natural substances (ὁμοιομερῆ) may have been that they represent such substances to a certain extent, viz. in so far as they were prefigurations of individual things made up of these. He did not – or, better, did not want to – acknowledge their real function as prefigurations or matrices, but represented them as particles of natural substances. In doing so he may or may not have tallied with contemporary exposers of Anaxagoras' doctrine. In any case, the doctrine could certainly be apprehended as a doctrine of particles. And conceived of as such, it could not stand criticism but appeared as illogical and ridiculous.

Now, granted that Aristotle actually did understand the true meaning of Anaxagoras' doctrine of the σπέρματα as prefigurations or matrices, while the contemporary general opinion held that they were particles, he was free to use the idea for his own purposes. Thus the Anaxagorean concept of σπέρματα may well have influenced and inspired Aristotle to attain his concept of εἴδη. There may also exist a

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[195] See above, pp. 19–21.

[196] See above, p. 66, n. 141. The term is an appropriate name for Anaxagoras' universal fused mixture, which can be regarded holistically as *one* thing (cf. above, pp. 68–69).

connection between the concept of matter in Anaxagoras and the concept of ὕλη in Aristotle. The primordial homogeneous fusion looked upon as a unified entity could possibly have presented itself as something like the very principle of matter.

The two basic concepts of Aristotle's seem to be latent in the theory of Anaxagoras. If one follows the line towards abstraction, which is clearly recognizable in it, one will naturally end in the εἴδη – ὕλη model of Aristotle. Thus we are entitled to surmise that he may have done so himself. This is not to say that he actually did, only that he may have done.

One thing should be clear: We ought to be cautious not to make the choice commonly made by interpreters of Anaxagoras, namely either to depreciate Anaxagoras or take Aristotle literally at his words. If we avoid both alternatives, then, on the one hand, the ingenious nature of Anaxagoras' theory will appear as obvious; and on the other, we will realize that Aristotle was entirely aware of its qualities and that he may have profited from these without advertising it but rather by concealing it under the disguise of the ὁμοιομερῆ and the particle conception, of which he very well knew that they were alien to Anaxagoras' theory of matter.

THE FRAGMENTS

B 1

῾Ομοῦ πάντα χρήματα ἦν, ἄπειρα καὶ πλῆθος καὶ σμικρότητα· καὶ γὰρ τὸ σμικρὸν ἄπειρον ἦν. καὶ πάντων ὁμοῦ ἐόντων οὐδὲν ἔνδηλον ἦν ὑπὸ σμικρότητος· πάντα γὰρ ἀήρ τε καὶ αἰθὴρ κατεῖχεν, ἀμφότερα ἄπειρα ἐόντα· ταῦτα γὰρ μέγιστα ἔνεστιν ἐν τοῖς σύμπασι καὶ πλήθει καὶ μεγέθει.

B 2

Καὶ γὰρ ἀήρ τε καὶ αἰθὴρ ἀποκρίνονται ἀπὸ τοῦ πολλοῦ τοῦ περιέχοντος, καὶ τό γε περιέχον ἄπειρόν ἐστι τὸ πλῆθος.

B 3

Οὔτε γὰρ τοῦ σμικροῦ ἐστι τό γε ἐλάχιστον, ἀλλ' ἔλασσον ἀεί (τὸ γὰρ ἐὸν οὐκ ἔστι τομῇ ⟨μὴ⟩ οὐκ εἶναι)[197] ἀλλὰ καὶ τοῦ μεγάλου ἀεί ἐστι μεῖζον. καὶ ἴσον ἐστὶ τῷ σμικρῷ πλῆθος, πρὸς ἑαυτὸ δὲ ἕκαστόν ἐστι καὶ μέγα καὶ σμικρόν.

B 4

Τούτων δὲ οὕτως ἐχόντων χρὴ δοκεῖν ἐνεῖναι πολλά τε καὶ παντοῖα ἐν πᾶσι τοῖς συγκρινομένοις καὶ σπέρματα πάντων χρημάτων καὶ ἰδέας παντοίας ἔχοντα καὶ χροιὰς καὶ ἡδονάς. καὶ ἀνθρώπους τε συμπαγῆναι καὶ τὰ ἄλλα ζῷα ὅσα ψυχὴν ἔχει καὶ τοῖς γε ἀνθρώποισιν εἶναι καὶ πόλεις συνημμένας[198] καὶ ἔργα κατεσκευασμένα, ὥσπερ παρ' ἡμῖν, καὶ ἠέλιόν τε αὐτοῖσιν εἶναι καὶ σελήνην καὶ τὰ ἄλλα, ὥσπερ παρ' ἡμῖν, καὶ τὴν γῆν αὐτοῖσι φύειν πολλά τε καὶ παντοῖα, ὧν ἐκεῖνοι τὰ ὀνήιστα συνενεγκάμενοι εἰς τὴν οἴκησιν χρῶνται. ταῦτα μὲν οὖν μοι λέλεκται περὶ τῆς ἀποκρίσιος, ὅτι οὐκ ἂν παρ' ἡμῖν μόνον ἀποκριθείη, ἀλλὰ καὶ ἄλλῃ.

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[197] See above, p. 72, footnote 151.

[198] See above, p. 15, footnote 32.

B 1 All things were together, infinite both in number and in smallness; for even the small was infinite. And all things being together, nothing was perceptible because of the smallness; for air and aether (together) prevailed, both being infinite; for these are the greatest in the (universal) mixture, both in number and size.

B 2 For air and aether are being separated off from the surrounding (universal) mass, and the surrounding (universal) mass is infinite in number.

B 3 For neither does the smallest of the small exist, but there is always something smaller – for it is not possible for the existent to be non-existent through cutting – but even of the great there is always something greater. And it is equal to the small in respect of number; and in relation to itself each (thing) is both great and small.

B 4 And since these (things) are so, it is necessary to suppose that many and sundry are in all those (things) that are uniting, and seeds of all things, having all kinds of shapes and surfaces and sensations; and to suppose that men have been condensed, and the other animals that have life; and that there are cities compounded for the men, and cultivated fields, as with us; and that they have sun and moon and the rest, as with us; and that the earth brings forth for them many and sundry, of which they garner the most useful into their dwellings and make use of them. This has been stated by me, then, speaking about the separating off, namely that not only with us was there separating off, but even elsewhere.

Πρὶν δὲ ἀποκριθῆναι ταῦτα πάντων ὁμοῦ ἐόντων οὐδὲ χροιὴ ἔνδηλος ἦν οὐδεμία· ἀπεκώλυε γὰρ ἡ σύμμιξις πάντων χρημάτων, τοῦ τε διεροῦ καὶ τοῦ ξηροῦ καὶ τοῦ θερμοῦ καὶ τοῦ ψυχροῦ καὶ τοῦ λαμπροῦ καὶ τοῦ ζοφεροῦ, καὶ γῆς πολλῆς ἐνεούσης καὶ σπερμάτων ἀπείρων πλῆθος οὐδὲν ἐοικότων ἀλλήλοις. οὐδὲ γὰρ τῶν ἄλλων οὐδὲν ἔοικε τὸ ἕτερον τῷ ἑτέρῳ. τούτων δὲ οὕτως ἐχόντων ἐν τῷ σύμπαντι χρὴ δοκεῖν ἐνεῖναι πάντα χρήματα.

B 5
Τούτων δὲ οὕτω διακεκριμένων γινώσκειν χρή, ὅτι πάντα οὐδὲν ἐλάσσω ἐστὶν οὐδὲ πλείω (οὐ γὰρ ἀνυστὸν πάντων πλείω εἶναι), ἀλλὰ πάντα ἴσα ἀεί.

B 6
Καὶ ὅτε δὲ ἴσαι μοῖραί εἰσι τοῦ τε μεγάλου καὶ τοῦ σμικροῦ πλῆθος, καὶ οὕτως ἂν εἴη ἐν παντὶ πάντα· οὐδὲ χωρὶς ἔστιν εἶναι, ἀλλὰ πάντα παντὸς μοῖραν μετέχει. ὅτε τοὐλάχιστον μὴ ἔστιν εἶναι, οὐκ ἂν δύναιτο χωρισθῆναι, οὐδ' ἂν ἐφ' ἑαυτοῦ γενέσθαι, ἀλλ' ὅπωσπερ ἀρχὴν εἶναι καὶ νῦν πάντα ὁμοῦ. ἐν πᾶσι δὲ πολλὰ ἔνεστι καὶ τῶν ἀποκρινομένων ἴσα πλῆθος ἐν τοῖς μείζοσί τε καὶ ἐλάσσοσι.

B 7
Ὥστε τῶν ἀποκρινομένων μὴ εἰδέναι τὸ πλῆθος μήτε λόγῳ μήτε ἔργῳ.

B 8
Οὐ κεχώρισται ἀλλήλων τὰ ἐν τῷ ἑνὶ κόσμῳ οὐδὲ ἀποκέκοπται πελέκει, οὔτε τὸ θερμὸν ἀπὸ τοῦ ψυχροῦ οὔτε τὸ ψυχρὸν ἀπὸ τοῦ θερμοῦ.

B 9
Οὕτω τούτων περιχωρούντων τε καὶ ἀποκρινομένων ὑπὸ βίης τε καὶ ταχυτῆτος. βίην δὲ ἡ ταχυτὴς ποιεῖ. ἡ δὲ ταχυτὴς αὐτῶν οὐδενὶ ἔοικε χρήματι τὴν ταχυτῆτα τῶν νῦν ἐόντων χρημάτων ἐν ἀνθρώποις, ἀλλὰ πάντως πολλαπλασίως ταχύ ἐστι'.

B 10
Πῶς γὰρ ἄν ἐκ μὴ τριχὸς γένοιτο θρὶξ καὶ σὰρξ ἐκ μὴ σαρκός;

But before these (things) were separated off, while all (things) were together, not even a surface was perceptible at all; for the mixture of all things prevented it, (the mixture) of the moist and the dry, and of the warm and the cold, and of the light and the dark, and of much earth being in it, and of seeds, infinite in number and in no respect like one another. For none of the other (things) either are like one to the other. And since this is so, it is necessary to suppose that all things are in the whole.

B 5 And when these (things) have been thus distinguished, we must know that all of them are by nothing less nor more – for it is impossible that they should be more than all – but all (things) are always equal.

B 6 And since the features of the great and the small are equal in number, for this reason, too, all (things) will be in everything. Nor is it possible to exist apart, but all (things) share a feature of everything. Since it is not possible that there should exist a smallest, it will not be possible for anything to be put apart nor to come by itself, but as it was originally, so even now all (things) must be together. And in all (things) there are many and they are equal in number in the greater as well as the smaller of those (things) that are separated off.

B 7 . . . so that we cannot know the number of those (things) that are separated off, either in word or deed.

B 8 These (things) that are in the one world have not been put apart nor cut off with an axe, neither the warm from the cold, nor the cold from the warm.

B 9 Thus these (things) revolve and are separated off by force and speed. And the speed makes the force. Their speed is not like anything when compared with the speed of the things now existing among men, but is in all ways many times as swift.

B 10 For how could hair come from what is not hair, and flesh from what is not flesh?

B 11
'Εν παντὶ παντὸς μοῖρα ἔνεστι πλὴν νοῦ, ἔστιν οἷσι δὲ καὶ νοῦς ἔνι.

B 12
Τὰ μὲν ἄλλα παντὸς μοῖραν μετέχει, νοῦς δέ ἐστιν ἄπειρον καὶ αὐτοκρατὲς καὶ μέμεικται οὐδενὶ χρήματι, ἀλλὰ μόνος αὐτὸς ἐπ' ἐωυτοῦ ἐστιν. εἰ μὴ γὰρ ἐφ' ἑαυτοῦ ἦν, ἀλλά τεῳ ἐμέμεικτο ἄλλῳ, μετεῖχεν ἂν ἁπάντων χρημάτων, εἰ ἐμέμεικτό τεῳ· ἐν παντὶ γὰρ παντὸς μοῖρα ἔνεστιν, ὥσπερ ἐν τοῖς πρόσθεν μοι λέλεκται· καὶ ἂν ἐκώλυεν αὐτὸν τὰ συμμεμειγμένα, ὥστε μηδενὸς χρήματος κρατεῖν ὁμοίως ὡς καὶ μόνον ἐόντα ἐφ' ἑαυτοῦ. ἔστι γὰρ λεπτότατόν τε πάντων χρημάτων καὶ καθαρώτατον, καὶ γνώμην γε περὶ παντὸς πᾶσαν ἴσχει καὶ ἰσχύει μέγιστον· καὶ ὅσα γε ψυχὴν ἔχει καὶ τὰ μείζω καὶ τὰ ἐλάσσω, πάντων νοῦς κρατεῖ. καὶ τῆς περιχωρήσιος τῆς συμπάσης νοῦς ἐκράτησεν, ὥστε περιχωρῆσαι τὴν ἀρχήν. καὶ πρῶτον ἀπό του σμικροῦ ἤρξατο περιχωρεῖν, ἐπὶ δὲ πλέον περιχωρεῖ, καὶ περιχωρήσει ἐπὶ πλέον. καὶ τὰ συμμισγόμενά τε καὶ ἀποκρινόμενα καὶ διακρινόμενα πάντα ἔγνω νοῦς. καὶ ὁποῖα ἔμελλεν ἔσεσθαι καὶ ὁποῖα ἦν, ἅσσα νῦν μὴ ἔστι, καὶ ὅσα νῦν ἐστι καὶ ὁποῖα ἔσται, πάντα διεκόσμησε νοῦς, καὶ τὴν περιχώρησιν ταύτην, ἣν νῦν περιχωρέει τά τε ἄστρα καὶ ὁ ἥλιος καὶ ἡ σελήνη καὶ ὁ ἀὴρ καὶ ὁ αἰθὴρ οἱ ἀποκρινόμενοι. ἡ δὲ περιχώρησις αὐτὴ ἐποίησεν ἀποκρίνεσθαι. καὶ ἀποκρίνεται ἀπό τε τοῦ ἀραιοῦ τὸ πυκνὸν καὶ ἀπὸ τοῦ ψυχροῦ τὸ θερμὸν καὶ ἀπὸ τοῦ ζοφεροῦ τὸ λαμπρὸν καὶ ἀπὸ τοῦ διεροῦ τὸ ξηρόν. μοῖραι δὲ πολλαὶ πολλῶν εἰσι. παντάπασι δὲ οὐδὲν ἀποκρίνεται οὐδὲ διακρίνεται ἕτερον ἀπὸ τοῦ ἑτέρου πλὴν νοῦ. νοῦς δὲ πᾶς ὅμοιός ἐστι καὶ ὁ μείζων καὶ ὁ ἐλάττων. ἕτερον δὲ οὐδέν ἐστιν ὅμοιον οὐδενί, ἀλλ' ὅτων πλεῖστα ἔνι, ταῦτα ἐνδηλότατα ἓν ἕκαστόν ἐστι καὶ ἦν.

B 13
Καὶ ἐπεὶ ἤρξατο ὁ νοῦς κινεῖν, ἀπὸ τοῦ κινουμένου παντὸς ἀπεκρίνετο, καὶ ὅσον ἐκίνησεν ὁ νοῦς, πᾶν τοῦτο διεκρίθη· κινουμένων δὲ καὶ διακρινομένων ἡ περιχώρησις πολλῷ μᾶλλον ἐποίει διακρίνεσθαι.

B 14
Ὁ δὲ νοῦς, ὃς ἀεί ἐστι, τὸ κάρτα[199] καὶ νῦν ἐστιν ἵνα καὶ τὰ ἄλλα

[199] The reading is uncertain; Sider (1974: 367) proposes to read: ὁ δὲ νοῦς ὅσα ἐστὶν ἐκράτησε καὶ νῦν κτλ.

B 11 In everything there is a feature of everything, except of mind, and there are some (things) in which there is mind as well.

B 12 Other things share a feature of everything, but mind is infinite and self-ruled and is mixed with nothing, but is alone, itself by itself. For if it were not by itself, but were mixed with something else, it would share in all things, if it was mixed with something; for in everything there is a feature of everything, as was said earlier by me; and those (things) that are mixed together would hinder it, so that it could not control anything in the same way as it does (now), being alone by itself. For it is the finest of all things and the purest, and it has knowledge of everything and has the greatest power. And mind has power over all (things) that have life, both the greater and the smaller ones. And mind got power over the whole rotation, so that it began to rotate in the beginning. And first it began to rotate from something small, and it is now rotating over a wider (area), and it shall rotate over a still wider. And those (things) that are mixed together and separated off and distinguished, all these mind got knowledge of. And all (things) which were to be and all those that were but are not now, and all that are now and all that shall be, mind arranged them all, and also this rotation, in which are now rotating the stars and the sun and the moon and the air and the aether which are being separated off. And this rotation caused the separating off. The dense is separated from the rare, and the warm from the cold, and the light from the dark, and the dry from the moist. And there are many features of many (things). And nothing is being entirely separated, nor distinguished from anything else, except mind. Mind is all alike, both the greater and the smaller, while nothing else is like anything else, but each single thing is and was most manifestly those (things) of which there is most in it.

B 13 And when mind initiated motion, there was separation out of all that which was moved, and as much as mind moved, all that was distinguished; and as things were moved and distinguished, the rotation made the process of distinguishing increase more.

B 14 And mind, which ever is, is certainly even now where all other

πάντα, ἐν τῷ πολλῷ περιέχοντι καὶ ἐν τοῖς προσκριθεῖσι καὶ ἐν τοῖς ἀποκεκριμένοις.

B 15
Τὸ μὲν πυκνὸν καὶ διερὸν καὶ ψυχρὸν καὶ τὸ ζοφερὸν ἐνθάδε συνεχώρησεν, ἔνθα νῦν ⟨ἡ γῆ⟩, τὸ δὲ ἀραιὸν καὶ τὸ θερμὸν καὶ τὸ ξηρὸν ἐξεχώρησεν εἰς τὸ πρόσω τοῦ αἰθέρος.

B 16
Ἀπὸ τουτέων ἀποκρινομένων συμπήγνυται γῆ· ἐκ μὲν γὰρ τῶν νεφελῶν ὕδωρ ἀποκρίνεται, ἐκ δὲ τοῦ ὕδατος γῆ, ἐκ δὲ τῆς γῆς λίθοι συμπήγνυνται ὑπὸ τοῦ ψυχροῦ, οὗτοι δὲ ἐκχωρέουσι μᾶλλον τοῦ ὕδατος.

B 17
Τὸ δὲ γίνεσθαι καὶ ἀπόλλυσθαι οὐκ ὀρθῶς νομίζουσιν οἱ Ἕλληνες· οὐδὲν γὰρ χρῆμα γίνεται οὐδὲ ἀπόλλυται, ἀλλ' ἀπὸ ἐόντων χρημάτων συμμίσγεταί τε καὶ διακρίνεται. καὶ οὕτως ἂν ὀρθῶς καλοῖεν τό τε γίνεσθαι συμμίσγεσθαι καὶ τὸ ἀπόλλυσθαι διακρίνεσθαι.

things are, in the surrounding (universal) mass, and in those (things) that have been united, and in the separated ones.

B 15 The dense and the moist and the cold and the dark came together here, where (they are) now; while the rare and the warm and the dry went out to the further part of the aether.

B 16 From these (things) that are separated off the earth is condensed; for water is separated off from the clouds, earth from the water, and out of the earth stones are condensed by the cold, and these move outwards more than the water.

B 17 The Hellenes do not have a correct opinion about coming to be and passing away; for nothing comes into being nor does it pass away, but it is mixed and distinguished out of existing things. Thus they will be right to call coming to be mixing, and passing away distinguishing.

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STUDIA GRAECA ET LATINA GOTHOBURGENSIA

Founded by INGEMAR DÜRING and HARALD HAGENDAHL
Published by the Institute of Classical Studies of the University of Göteborg
Editors: CAJUS FABRICIUS and ÅKE FRIDH
ISSN 0081-6450

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